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Parts I and II
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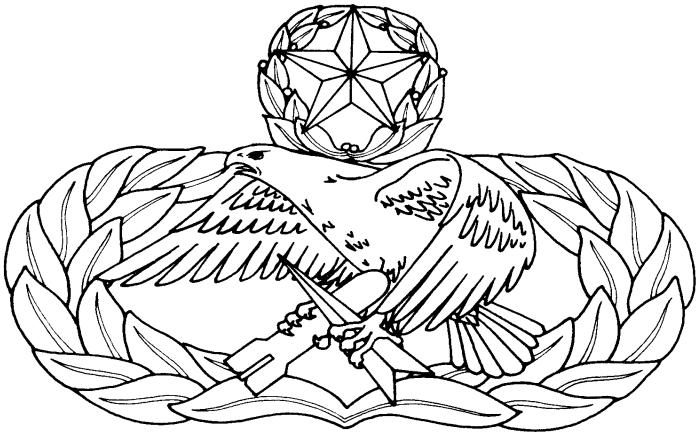
AFSC 2E1X2

METEOROLOGICAL AND NAVIGATION SYSTEMS



CAREER FIELD EDUCATION AND TRAINING PLAN

METEOROLOGICAL AND NAVIGATION SYSTEMS
AFSC 2E1X2
CAREER FIELD EDUCATION AND TRAINING PLAN

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Supersedes CFETP 2E1X2, Parts I and II
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OPR: HQ USAF/ILMM, CMSgt Watlington
Editors: HQ AFCA/WFIM MSgt Ciaruffoli; 338 TRS/TRR, Mr. Maggard;
81 TRSS Qualification Training Flight, MSgt Rivera and TSgt Rivera

Certified by: HQ USAF/ILM Mr. Grover L. Dunn
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METEOROLOGICAL AND NAVIGATION SYSTEMS
AFSC 2E1X2
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PART I

Preface

1. Resource constraints in the Air Force are impacting the availability of our most valuable resource--people. This condition, which will continue to exist in the future, makes it essential for the work force to be effectively and efficiently trained to perform duties within each skill level of an Air Force Specialty (AFS). To meet the challenges of tomorrow the Air Force must place a greater emphasis on career field training. This Career Field Education and Training Plan (CFETP) is a management tool that enables the Air Force and each MAJCOM to place the needed emphasis on total career field training. It provides the framework and guidance necessary to plan and develop a career field training program. The plan, which is a "training road map" for the career field, identifies mandatory and optional training requirements. It includes initial skills, upgrade, and continuation training that individuals should receive during their career in this specialty.

2. The CFETP, which documents the career field training program, consists of two parts. Management uses both parts to plan, manage, and control training within the career field.

2.1. Part I, Section A, provides the information necessary for overall management of training in the career field. It contains administrative details and explains the purpose and use of the CFETP. Section B provides a description of the specialty, suggests career field progression, provides career field information, documents training decisions, defines each skill level, and identifies MAJCOM continuation training options. Section C specifies qualification requirements for upgrade/progression in each subsequent skill level in the career field. It also identifies sources of training other than those provided by the Air Education and Training Command (AETC). Section D identifies known resource constraints.

2.2. Part II of the CFETP contains the Specialty Training Standard (STS) and identifies the various training sources and courses available to members of the specialty. The STS is comprised of the Course Training Standard (CTS) and the Career Training Guide (CTG). The CTS includes the tasks and knowledge requirements for award of the three skill level. The CTG includes task and knowledge requirements for upgrade/progression to subsequent skill levels in the career field and identifies proficiency levels achieved in initial skills training and the Career Development Course (CDC). Supervisors and trainers at the unit level use Part I, Section C, and Part II of the CFETP to identify, plan, and conduct unit level training commensurate with the overall goals of this plan.

3. Use of the guidance provided in this CFETP ensures individuals in this career field receive effective and efficient training at the appropriate points in their careers. This plan enables the Air Force to train today's work force for tomorrow's jobs.

Abbreviations/Terms Explained

This section provides a common understanding of the terms that apply to the Meteorological and Navigation Systems Career Field and Education Training Plan.

Advanced Training. A formal course of training that leads to a technical or supervisory level of an AFS. Training is for selected airmen at the advanced level of an AFS.

Air Education Training Command (AETC).

Air Force Career Field Manager (AFCFM). Representative appointed by the respective HQ USAF Deputy Chief of Staff or Under Secretariat to ensure that assigned AF specialties are trained and utilized to support AF mission requirements.

Air Force Institute for Advanced Distributed Learning (AFIADL). The result of a merger between the Air Force Distance Learning Office and the Extension Course Institute (ECI).

Air Force Job Qualification Standard (AFJQS). A comprehensive task list that describes a particular job type or duty position. Supervisors use the AFJQS to document task qualification. The tasks on AFJQSs are common to all persons serving in the described duty position.

Air Force Qualification Training Package (AFQTP). An instructional course designed for use at the unit to qualify or aid qualification in a duty position, program, or on a piece of equipment. It may be printed, computer-based, or other audiovisual media.

Air Force Specialty (AFS). A group of positions (with the same title and code) that require common qualifications.

Career Field Education and Training Plan (CFETP). A comprehensive, multipurpose document, that encapsulates the entire spectrum of career field training. It outlines a logical growth plan that includes training resources and is designed to make career field training identifiable, eliminate duplication, and is budget defensible. CFETPs are officially posted at http://afpubs.hq.af.mil/. You can also download them from http://www.il.hq.af.mil/ilm/ilmm/cemaint/index.html or https://wwwmil.keesler.af.mil/81trss/qflight/welcome.html.

Career Training Guide (CTG). A document that uses Task Modules (TM) in lieu of tasks to define performance and training requirements for a career field.

Certifying Official. A person assigned by the commander to determine an individual's ability to perform a task to the required standard.

Computer Based Training (CBT). A forum for training in which the student learns via a computer terminal. It is an especially effective training tool that allows the students to practice applications while they learn.

Continuation Training. Additional advanced training that exceeds the minimum upgrade training requirements and emphasizes present or future duty assignments.

Core Task. A task Air Force Career Field Managers (AFCFM) identify as a minimum qualification requirement within an AFSC or duty position.

Course Training Standard (CTS). A standard developed for all courses not governed by an STS, including specialized training packages and computer-based training courses.

Enlisted Specialty Training (EST). A mix of formal training (technical school) and informal training (on-the-job) to qualify and upgrade airmen in each skill level of a specialty.

Exportable Training. Additional training via computer assisted, paper text, interactive video, or other necessary means to supplement training.

Go/No Go. In OJT, it is the stage at which an individual has gained enough skill, knowledge, and experience to perform a task without supervision.

Initial Skills Training. A formal resident course resulting in award of the 3-skill level.

Instructional System Development (ISD). A deliberate and orderly (but flexible) process for planning, developing, implementing, and managing instructional systems. It ensures personnel are taught in a cost efficient way the knowledge, skills, and attitudes essential for successful job performance.

Major Command (MAJCOM).

Occupational Survey Report (OSR). A detailed report showing the results of an occupational survey of tasks performed within a particular AFSC.

On-the-Job Training (OJT). Hands-on, over-the-shoulder training conducted to certify personnel in both upgrade (skill level award) and job qualification (duty position certification) training.

Qualification Training. Actual hands-on, task performance based training designed to qualify airmen in a specific duty position. This training program occurs both during and after the upgrade training process and is designed to provide skills training required to do the job.

Resource Constraints. Resource deficiencies (such as money, facilities, time, manpower, and equipment) that preclude desired training from being delivered.

Skill Training. A formal course that results in the award of a skill level.

Specialty Training Package and COMSEC Qualification Training Package. A composite of lesson plans, test material, instructions, policy, doctrine, and procedures necessary to conduct training. These packages are prepared by AETC, approved by National Security Agency (NSA), and administered by qualified communications security (COMSEC) maintenance personnel.

Specialty Training Standard (STS). An Air Force publication that describes skills and knowledge that an airman in a particular AFSC needs on the job. It further serves as a contract between AETC and the user to show the overall training requirements for an AFSC that the formal schools teach.

Standard. An exact value, a physical entity, or an abstract concept established and defined by authority, custom, or common consent to serve as a reference, model, or rule in measuring quantities or qualities, establishing practices or procedures, or evaluating results. It is a fixed quantity or quality.

Task Module (TM). A group of tasks performed together within an AFSC that requires common knowledge, skills, and abilities. TMs are identified by an identification code and a statement.

Total Force. All collective components (active, reserve, guard, and civilian elements) of the United States Air Force.

Training Capability. The capability of a training setting to provide training on specified requirements, based on the availability of resources.

Training Planning Team (TPT). Comprised of the same personnel as a U&TW, TPTs are more intimately involved in training development and the range of issues examined is greater than in the U&TW forum.

Training Requirements Analysis (TRA). A detailed analysis of tasks for a particular AFSC to be included in the training decision process.

Training Setting. The type of forum in which training is provided (formal resident school, on-the-job, field training, mobile training team, self-study, etc.).

Upgrade Training. Training that leads to the award of a higher skill level.

Utilization and Training Pattern. A depiction of the training provided to and the jobs performed by personnel throughout their tenure within a career field or AFS. There are two types of patterns: 1) Current pattern, which is based on the training provided to incumbents and the jobs to which they have been and are assigned; and 2) Alternate pattern, which considers proposed changes in manpower, personnel, and training policies.

Utilization and Training Workshop (U&TW). A forum of the AFCFM, MAJCOM functional managers, subject matter experts (SME), and AETC training personnel that determines career ladder training requirements.

Section A - General Information

1. Purpose of the CFETP. This CFETP provides the information necessary for career field managers, training management, supervisors, and trainers to plan, develop, manage, and conduct an effective and efficient career field training program. The plan outlines the training that individuals should receive in order to develop and progress throughout their careers. For purposes of this plan, training is divided into three areas: initial skills, upgrade, and continuation training. Initial skills training is the AFS specific training an individual receives upon entry in the Air Force, normally conducted by AETC at one of the technical training centers. Upgrade training identifies the mandatory courses, task qualification requirements, and Career Development Course (CDC) completion required for award of the 5-, 7-, or 9-skill level. Continuation training is additional training provided to 3-, 5-, 7-, and 9-level personnel to increase their skills and knowledge beyond the minimum required for upgrade. The CFETP has several purposes, some of which are:

1.1. Serves as a management tool to plan, develop, manage, and conduct a career field training program. Also, ensures that established training is provided at the appropriate point in an individual's career.

1.2. Identifies task and knowledge training requirements for each skill level in the specialty and recommends training throughout each phase of an individual's career.

1.3. Lists training courses available in the specialty, identifies sources of the training, and provides the training medium.

1.4. Identifies major resource constraints that impact implementation of the desired career field training program.

2. Use of the CFETP. The CFETP is maintained by the Air Force Career Field Manager (AFCFM). MAJCOM Functional Managers and AETC review the plan annually to ensure currency and accuracy and forward recommended changes to the AFCFM. Using the list of courses in Part II, they determine whether duplicate training exists and take steps to eliminate/prevent duplicate efforts. Career field training managers at all levels use the plan to ensure a comprehensive and cohesive training program is available for each individual in the career ladder.

2.1. AETC training personnel develop/revise formal resident and exportable training based upon requirements established by the users and documented in the STS. They also develop procurement and acquisition strategies for obtaining resources needed to provide the identified training.

2.2. MAJCOM Functional Managers ensure their training programs complement the CFETP mandatory initial skill and upgrade requirements. They also identify the needed AFJQSs/AFQTPs to document unique upgrade and continuation training requirements. Requirements are satisfied through OJT, resident training, or exportable courseware/courses. MAJCOM developed training to support this AFSC must be identified for inclusion into this plan. Forward recommendations concerning this CFETP to your MAJCOM Functional Manager.

2.3. 81 TRSS Qualification Training Flight (Q-Flight) personnel develop AFJQSs/AFQTPs based on requests submitted by the MAJCOMs and according to the priorities assigned by the Communications-Electronics (C-E) Maintenance Training Advisory Group (MATAG) Working Group.

2.4. Unit level training managers and supervisors manage and control progression through the career field by ensuring individuals complete the mandatory training requirements for upgrade specified in this plan and supplemented by their MAJCOM. The list of courses in Part II is used as a reference for planning continuation or career enhancement training.

3. Coordination and Approval of the CFETP. The AFCFM is the approval authority. MAJCOM representatives and AETC training personnel coordinate on the career field training requirements. The AFCA Mission Area Manager (MAM) reviews CFETPs for accuracy prior to submission for approval by the AFCFM.

Section B - Career Field Progression and Information

4. Specialty Description. This information supplements that presented in AFMAN 36-2108.

4.1. **Meteorological and Navigation Systems Apprentice/Journeyman**.

4.1.1. Specialty Summary. Installs, maintains, modifies, and repairs fixed or transportable meteorological and navigation systems. Accomplishes flight inspection technician duties. Analyzes equipment performance trends and system procedures. Deploys, sets up, relocates, and places meteorological and navigation systems in operation.

4.1.2. Duties and Responsibilities:

4.1.2.1 Installs, removes, and relocates meteorological and navigation systems. Studies system characteristics, local terrain, planned base facilities, and requirements to determine equipment position. Checks and inventories equipment and project materials for serviceability. Assembles, connects, and wires components, assemblies, and antenna systems. Performs operational tests, adjusts, and aligns equipment. Tunes and aligns components to comply with technical order specifications. Completes commissioning flight inspection. Places equipment in operation.

4.1.2.2. Deploys and activates transportable meteorological and navigation systems. Prepares equipment for deployment. Inspects equipment for serviceability before and after relocation. Deploys and sets up equipment. Conducts equipment tests for proper assembly and compliance with technical orders. Completes flight inspection. Places systems in operation.

4.1.2.3. Maintains meteorological and navigation systems. Uses specialized test equipment and software controlled diagnostics to isolate malfunctions. Repairs systems according to technical orders, manufacturer's handbooks, and local procedures. Tunes, aligns, and adjusts equipment. Completes flight inspections. Cleans and lubricates equipment. Accomplishes equipment modifications according to time compliance technical orders or field directives. Performs corrosion control. Completes performance tests and evaluates results to ensure proper system operation. Oversees work in progress and reviews completed repairs for sound maintenance practices. Initiates action to correct unsatisfactory equipment performance trends.

4.1.2.4. Maintains inspection and maintenance records. Posts entries on maintenance and inspection records. Records meter readings, test results, and historical data in equipment performance logs. Completes maintenance data collection and equipment status reporting forms. Recommends methods to improve technical data, system performance, and maintenance procedures. Updates technical data.

4.1.2.5. Maintains and posts entries on Communications Systems Installation Records (CSIR). Processes civil engineering work clearance requests. Operates and maintains tools, test equipment, auxiliary equipment, and vehicles.

4.1.2.6. Requisitions, accounts for, and turns in supplies and materials.

4.1.2.7. Ensures compliance with safety policies and procedures.

4.2. **Meteorological and Navigation Systems Craftsman**.

4.2.1. Specialty Summary. Includes all information in paragraph 4.1.1. Supervises meteorological and navigation systems maintenance activities. Plans and schedules installation and maintenance of meteorological and navigation systems.

4.2.2. Duties and Responsibilities.

4.2.2.1. Includes all duties and responsibilities of paragraph 4.1.2.

4.2.2.2. Supervises Meteorological and Navigation maintenance Activities. Establishes requirements for maintenance equipment, support equipment, tools, and spare parts. Establishes work standards, methods, and controls for functions such as periodic inspections, operational testing, and component repair. Recommends equipment repair, replacement, or depot overhaul. Interprets inspection findings

and determines adequacy of corrective action. Reviews and ensures compliance with maintenance management publications and procedures. Develops and enforces safety standards for meteorological and navigation activities. Certifies facility flight inspections. Certifies navigation facilities. Coordinates with appropriate agencies to ensure systems support requirements.

4.2.2.3. Resolves problems encountered during siting, installation, repair, overhaul, and modification of meteorological and navigation systems. Uses layout drawings, schematics, and pictorial diagrams to solve maintenance problems, and analyzes construction, employment, and operating characteristics of equipment to determine source of malfunction. Performs intricate alignment and calibration procedures. Determines repair procedures necessary to correct defective equipment. Interprets and implements maintenance and installation policy and procedures. Evaluates justification and practicality of recommended improvements to equipment performance and maintenance procedures.

4.2.2.4. Inspects meteorological and navigation systems and associated support and peripheral equipment and systems to determine operational status. Interprets inspection findings, and determines adequacy of corrective actions. Reviews, evaluates, and resolves documented deficiencies. Checks new and repaired components for technical order compliance prior to installation.

4.2.2.5. Plans, schedules, coordinates, and implements installation, repair, modification, or overhaul of meteorological and navigation systems and associated support and peripheral equipment and systems. Ensures maintenance data collection forms and inspection and maintenance records are completed correctly and accurately.

4.3. **Communications Systems Superintendent.**

4.3.1. Specialty Summary. Manages and directs communication systems maintenance activities.

4.3.2. Duties and Responsibilities. This specialty “caps” at the Senior Master Sergeant level with those personnel that came up through the 2E0XX and 2E1XX career fields. Therefore, the duties and responsibilities defined below encompass the complete spectrum of this specialty.

4.3.2.1. Plans and organizes communication systems maintenance activities. Establishes production controls and performance standards according to technical publications. Prepares and analyzes reports. Maintains liaison with other organizations to ensure quality of service and to resolve technical and operational difficulties.

4.3.2.2. Directs communication systems maintenance activities. Ensures conformance with prescribed quality and safety standards including hazardous communications program. Establishes priority for completing equipment repair for communication systems. Observes performance of such functions as testing and repairing equipment and installing new components. Establishes maintenance and repair policies, procedures, and technical orders. Supervises maintenance documentation and report preparation.

4.3.2.3. Inspects and evaluates communication systems maintenance activities. Conducts inspection of communication systems maintenance activities to determine operational status and solves maintenance problems. Reviews inspection findings and recommends corrective actions.

4.4. **Communications-Electronics Systems Chief Enlisted Manager**. This specialty “caps” at the Chief Master Sergeant Level with those specialties that came up through the 2E0XX, 2E1XX, 2E2XX, 2E3XX, and 2E6XX career ladders. Personnel attaining the rank of Chief are assigned broad ranging duties in directing and managing diverse functions such as activities that install, remove, relocate, repair, and maintain radar systems (air traffic control and aircraft control and warning), telephone systems, satellite, wideband and telemetry systems, ground radio systems, meteorological and navigation systems, visual, imagery and intrusion detection systems, computer, network, switching and cryptographic, and antenna and cable systems. Other challenges that these Chiefs face are assignments to the White House Communications Agency, Air Force Element at CENTCOM, the Air Force Communications Agency, Defense Information Systems Agency, NATO, etc.

4.5. **The following are some of the more common missions you may encounter as a 2E1X2.**

METEOROLOGICAL SYSTEMS

FIXED SYSTEMS

AN/FMQ-8 Ambient Temperature and Dewpoint Measuring Set

AN/FMQ-13 Wind Measuring Set

ML-658/GM Digital Altimeter-Barometer

AN/GMQ-32 Transmissometer Set

DEPLOYABLE SYSTEMS

AN/TMQ-34 Meteorological Measuring Set

AN/GMQ-33 Transportable Cloud Height Set

AN/GMQ-34 Cloud Height Set

AN/TMQ-36 Tactical Wind Measuring Set

NAVIGATION SYSTEMS

FIXED SYSTEMS

AN/FRN-45 Tactical Air Navigation System

INSTRUMENT LANDING SYSTEM

AN/GRN-30 Localizer

AN/GRN-31 Null Reference Glideslope

AN/FRN-44 VHF Omnirange

DEPLOYABLE SYSTEMS

AN/TRN-45 Mobile Microwave Landing System

AN/TRN-41 Tactical Air Navigation System

AN/TRN-26 Tactical Air Navigation System

5. Skill/Career Progression. Adequate training and timely progression from the apprentice to superintendent skill levels play an important role in the Air Force's ability to accomplish its mission. It is essential that everyone involved in training do their part to plan, manage, and conduct an effective training program. The guidance provided in this part of the CFETP and the 2E1X2 Education and Training Path table will ensure individuals receive viable training at appropriate points in their careers.

Apprentice (3-Level) Training
Upon completion of initial skills training a trainee will work with a trainer to enhance their knowledge and skills.
Utilize CDCs, AFJQSs/AFQTPs, and other exportable courses to progress in the field.
Once task certified, a trainee may perform the task unsupervised.
Journeyman (5-Level) Training
Enter into continuation training to broaden experience base.
Five-levels may be assigned job positions such as team leader and shift supervisor.
Attend the Airman Leadership School (ALS) after serving 48 months in the Air Force or selection to rank of SSgt (active duty only). In-residence or correspondence course is required for Air National Guard/Air Force Reserve Command (ANG/AFRC) personnel.
Use CDCs and other references identified by the AFCFM to prepare for Weighted Airman Performance Systems (WAPS) testing.
Should continue pursuing a Community College of the Air Force (CCAF) degree.
Craftsman (7-Level) Training
A seven-level can expect to fill various supervisory and management positions such as shift leader, team chief, supervisor, or task certifier.
Seven-levels should take courses or obtain added knowledge on management of resources and personnel and attend the 7-level resident course.
Encouraged continuing academic education through CCAF and higher degree programs.
Attend the Noncommissioned Officer Academy (NCOA). In-residence or correspondence course is required for ANG/AFRC personnel.
Superintendent (9-Level) Training
A nine-level can be expected to fill positions such as flight chief, superintendents, and various staff positions.
Should pursue increased knowledge for budget, manpower, resources, and personnel management.
Recommend they pursue additional education and completion of courses outside of their AFS
Attend the Senior Noncommissioned Officer Academy (SNCOA).
Chief Enlisted Manager (CEM) Training
Must be selected for CMSgt and possess qualifications in a feeder specialty (2E190, 2E291, and 2E690).
CEMs work in a variety of similar jobs and functional areas where general managerial and supervisory abilities can be most effectively used and challenged.
Resident graduation of the USAF Senior NCO Academy (SNCOA) is a prerequisite for CMSgt sew-on (active duty only). In-residence or correspondence course required for ANG/AFRC personnel.

6. Training Decisions. This CFETP was developed to encapsulate an entire spectrum of training requirements for the Meteorological and Navigation Systems career field, using a building block approach (simple to complex). Included in this spectrum was the strategy of when, where, and how to meet the training requirements. The strategy must be apparent and affordable to reduce duplication of training and eliminate a disjointed approach to training. The following decisions were made by members of the 8-11 February 2000 Utilization and Training Workshop.

6.1. Initial Skills. Circuit level theory in the meteorological portion of the course was reduced to block level theory to reflect actual maintenance in the field. The addition of the 100-watt amplifier alignment on the AN/FRN-45 TACAN was added to familiarize students with one of the most critical alignments in the field.

6.2. Five-Level Upgrade Requirements. All "pk" tasks were changed to K to reflect the proper use of the CDCs in upgrade training. Performance tasks should be taught during the OJT process and technical orders or authoritative commercial manuals need to be used. Very few core OJT tasks were altered. Additionally, upgrade requirements were updated to include eight standardized areas common to all career fields. The following list identifies the major areas covered: test equipment, standardized maintenance practices, computer security, standard installation practices, communication principles, expeditionary communications principles, information transport concepts, and electrical power systems. A review of CDCs resulted in future development being restricted to six volumes. Development of this single set of CDCs will include three volumes which will be used by all 2EXXX career fields. The following table outlines 5-level CDC contents.

VOLUME 1	Electronic Principles (Computer Based Training)
VOLUME 2	Test Equipment
VOLUME 3	Communication Principles
VOLUME 4	AFSC Specific Information
VOLUME 5	AFSC Specific Information
VOLUME 6	AFSC Specific Information

6.3. Seven-Level Upgrade Requirements. Seven level training requirements were added to provide a common core of proficiency among all individuals in 2EXXX arena. Training covers deployment concepts, system planning and implementation, and management principles.

6.4. Proficiency Training. This training is job qualification for an assigned duty position. Additional qualification training becomes necessary when personnel transfer to another duty position, the unit mission changes, a new personnel program comes on board, or any time changes in techniques or procedures occur.

6.5. Continuation Training: The purpose of the continuation training program is to provide additional advanced training, exceeding the minimum upgrade training requirements, with the emphasis on present and future duty positions. MAJCOMs may develop a continuation training program to ensure individuals in the career field receive the necessary training at the appropriate points in their careers. The training program will identify both mandatory and optional training requirements.

7. Community College of the Air Force (CCAF) Academic Programs. Enrollment in CCAF occurs upon completion of basic military training. CCAF provides the opportunity for all enlisted members to obtain an Associate in Applied Science degree. The degree must be completed before the student separates from the Air Force, retires, or is commissioned as an officer. In addition to its associates degree program, CCAF offers the following:

7.1. Occupational Instructor Certification. The College offers the Occupational Instructor Certification to instructors teaching full time in a CCAF affiliated school. To qualify, instructors must complete an instructor course, a teaching practicum, have two years teaching experience, hold an associate or higher degree, and be recommended by their commander/commandant.

7.2. Trade Skill Certification. When a CCAF student separates or retires, a trade skill certification is awarded for the primary occupational specialty. The College uses a competency based assessment process for trade skill certification at one of four proficiency levels-Apprentice, Journeyman, Craftsman/Supervisor, or Master Craftsman/Manager. All are transcribed on the CCAF transcript.

7.3. The Electronic Systems Technology (4VHP) program applies to 2EXXX career fields.

7.3.1. Degree Requirements: Individuals must hold the 5-skill level at the time of program completion.

	Semester hours
Technical Education	24
Leadership, Management, and Military Studies	6
Physical Education	4
General Education	15
Program Electives	15
Total	64

7.3.2. Technical Education (24 semester hours): A minimum of 12 semester hours of Technical Core subjects and courses must be applied and the remaining semester hours will be applied from Technical Core/Technical Elective subjects and courses.

7.3.3. Leadership, Management, and Military Studies (6 semester hours): Professional military education and/or civilian management courses. See CCAF General Catalog for application of civilian management courses.

7.3.4. Physical Education (4 semester hours): Satisfied upon completion of basic military training.

7.3.5. General Education (15 semester hours): Courses must meet the criteria for application of courses to the General Education requirement and be in agreement with the definitions of applicable General Education subjects/courses as outlined in the CCAF General Catalog.

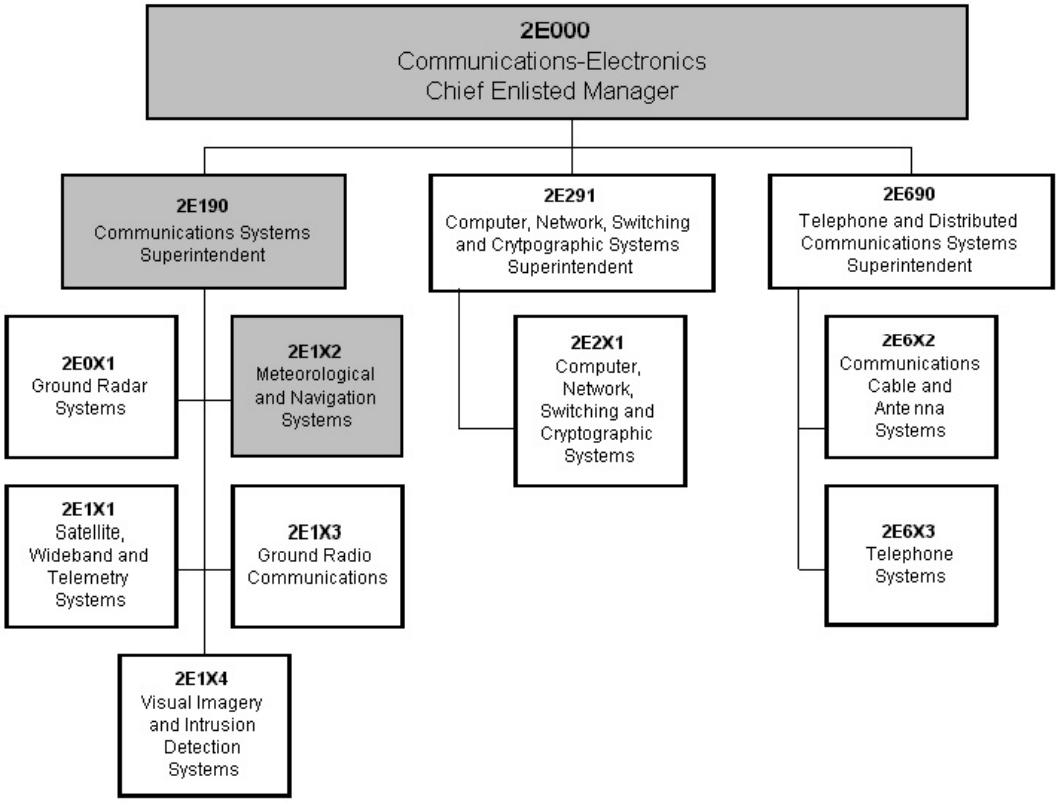
7.3.6. Program Elective (15 semester hours): Satisfied with applicable Technical Education; Leadership, Management, and Military Studies; or General Education courses, including natural science courses meeting General Education requirement application criteria. Six semester hours of CCAF degree applicable technical credit otherwise not applicable to this program may be applied.

7.4. See the current CCAF General Catalog for details regarding the Associates of Applied Science in Electronic Systems Technology. The catalog is available at your education officer or from http://www.au.af.mil/au/ccaf.

7.5. Additional off-duty education is a personal choice that is encouraged for all. Individuals desiring to become an AETC instructor should be actively pursuing an associate degree. A degreed faculty is necessary to maintain CCAF's accreditation through the Southern Association of Colleges and Schools.

8. Career Field Path. The following summarizes career progression and personnel allocations across the career ladder. 2E1XX and 2E0X1 personnel maintain their individual AFSC identifiers through the rank of MSgt. Upon promotion to SMSgt, AFSC 2E1X1, 2E1X2, 2E1X3, 2E1X4, and 2E0X1 merge to become a 2E190. At Chief, the 2E190 merges with other 2EXXX 9-level specialties to become a 2E000. Specific demographic information is available on the Web at http://www.afpc.randolph.af.mil/demographics/demograf/CAFSC.html.

2EXXX Career Field Progression



2E1X2 METEOROLOGICAL AND NAVIGATION SYSTEMS
EDUCATION AND TRAINING PATH

EDUCATION AND TRAINING REQUIREMENTS	AVERAGE SEW ON TIME AND COMMENTS
BASIC MILITARY TRAINING SCHOOL	
APPRENTICE TECHNICAL SCHOOL (3-SKILL LEVEL)	Airman .....6 months
UPGRADE TO JOURNEYMAN (5-SKILL LEVEL) Minimum 15 months OJT training (9 months for retrainees). Completion of all 2E152 CTG core tasks and 5-Level CDCs. ..... Mandatory Specific AFJQSs/AFQTPs for equipment at assigned location. ..... Mandatory Maintenance Management and Generic AFJQSs/AFQTPs for various unit level duties. ..... Mandatory AETC Supplemental training courses as determined by MAJCOM ..... Optional AFETS/CFS/SMT training as determined by MAJCOM..... Optional	A1C.....16 months SrA.....3 years Earliest.....3 years HYT .....10 years
AIRMAN LEADERSHIP SCHOOL (ALS) Attendance is limited to SSgt selectees or those attaining 48 months Total Active Federal Military Service (TAFMS) and who have not been selected for promotion to SSgt. Completion is mandatory before assuming the rank of SSgt. ANG/AFRC may complete by correspondence course. ..... Mandatory	TRAINER: Any rank may qualify as a trainer provided they attend a formal OJT Trainer course; are officially appointed by the commander; and are certified on the task they are training.
UPGRADE TO CRAFTSMAN (7-SKILL LEVEL) Minimum rank of SSgt. 12 months OJT training. Completion of all 2E172 CTG core tasks and AFQTP 2EXXX-201L, Communications-Electronics Work Center Manager's Handbook. Attendance at formal 7-level school. Must be 7-level to sew on TSgt. ..... Mandatory Maintenance Management and Generic AFJQSs/AFQTPs for various unit level duties. ..... Mandatory AETC Supplemental training courses as determined by MAJCOM ..... Optional AFCA Systems Seminar at Scott AFB. Consult your MAJCOM for course quotas ..... Optional AFETS/CFS/SMT training as determined by MAJCOM..... Optional	SSgt.....7.5 years Earliest.....3 years HYT .....20 years TSgt.....12.5 years Earliest.....5 years HYT .....22 years CERTIFIER: Must be a SSgt and possess at least a 5-skill level or equivalent experience (civilians); be officially appointed by the commander; attend a formal OJT Certifier course; be certified on the task they are certifying; and be a person other than the trainer.

2E1X2 METEOROLOGICAL AND NAVIGATION SYSTEMS EDUCATION AND TRAINING PATH	
EDUCATION AND TRAINING REQUIREMENTS	AVERAGE SEW ON TIME AND COMMENTS
NONCOMMISSIONED OFFICER ACADEMY (NCOA). Attendance is limited to TSgt and TSgt selectees. Completion is mandatory before assuming the rank of MSgt. ANG/AFRC may attend in-residence as SSgt or TSgt or complete correspondence course. NCOA Correspondence Course..... Optional	MSgt.....16 years Earliest.....8 years HYT .....24 years
USAF SENIOR NONCOMMISSIONED OFFICER ACADEMY (SNCOA) Attendance is limited to SMSgt, SMSgt selectees, and selected MSgts. Completion is mandatory before assuming the rank of CMSgt. ..... Mandatory SNCOA Correspondence Course ..... Optional ANG/AFRC may complete by correspondence course. ANG/AFRC MSgts may attend in-residence. ..... Mandatory	SMSgt.....19.2 years Earliest.....11 years HYT .....26 years
UPGRADE TO SUPERINTENDENT (9-SKILL LEVEL) Minimum rank of SMSgt. Complete SNCOA……..Mandatory Complete AFQTP 2EXXX-201LB, Communications-Electronics Manager's Handbook. ..... Mandatory Maintenance Management and Generic AFJQSs/AFQTPs for various unit level duties..... Mandatory	CMSgt.....21.5 years Earliest.....14 years HYT .....30 years

NOTE 1: Published sew on times are Air Force averages. Refer to the Air Force Personnel Center's homepage to determine career field specific information: http://www.afpc.randolph.af.mil/eprom.

NOTE 2: See Part II, Section D for a list of AFJQSs/AFQTPs, AETC supplemental, and AFETS/CFS/SMT training.

Section C - Skill Level Training Requirements

9. Purpose. The various skill levels in the career field are defined in terms of tasks and knowledge requirements for each skill level in the Meteorological and Navigation Systems career field of the Communications-Electronics Systems career ladder. They are stated in broad, general terms and establish the standards of performance. An all encompassing core task list has not been developed for this specialty because of the diversity of the missions supported and the equipment installed to meet mission requirements. Core tasks, knowledge items, and skill requirements for this specialty are identified in the STS, CDCs, AFJQSs/AFQTPs, etc. Completion of the mandatory 3-level skill awarding course, CDCs, 7-level course, and applicable AFJQSs/AFQTPs define the Air Force core tasks for this specialty.

10. Specialty Qualification Requirements.

10.1. **Apprentice (3-Level) Training.**

KNOWLEDGE	Discrete and integrated electronic components, electronic principles, analog and digital electronic circuits, microprocessors, and data processing Mathematics principles required to solve electronic formulas; Boolean algebra theory and number systems Principles of meteorological and navigation systems maintenance Use of technical data and blueprints Advanced troubleshooting techniques; system block, data flow, schematic, logic, and interconnecting wiring diagrams Principles and use of test equipment and diagnostic systems Advanced soldering techniques
EDUCATION	Completion of high school with courses in physics and mathematics and having a basic knowledge of computers is desirable.
TRAINING	Electronics Principles, course E3AQR2E132 481 (PDS Code PO1) (See Attachment 1 of the STS for course training standard) Meteorological and Navigation Systems Apprentice, course E3ABR2E132 002 (PDS Code MTO) (See Attachment 2 of the STS for course training standard)
EXPERIENCE	None required.
OTHER	Normal color vision is required for entry into this AFSC as defined by AFI 48-123, *Medical Examination and Standards*. Qualification to operate government vehicles according to AFI 24-301, *Vehicle Operations*. Freedom from fear of heights is mandatory for award and retention of this AFSC. Eligibility for a Secret security clearance according to AFI 31-501, *Personnel Security Program Management*, is mandatory for award and retention of this AFSC.
IMPLEMENTATION	Entry into training is accomplished by reserving a position in the career field upon entry into the Air Force.

10.2. **Journeyman (5-Level) Training.**

KNOWLEDGE	No additional knowledge requirements.
TRAINING	No AETC training requirement.
EXPERIENCE	Qualification and possession of AFSC 2E132 Experience in functions such as installing, testing, aligning, repairing, flight inspecting, and removing meteorological and navigation systems. Completion of the 2E152 Career Development Course Completion of all 2E152 CTG core tasks (See Attachment 3 of the STS for career training guide) Completion of applicable equipment AFJQSs/AFQTPs Completion of all local tasks assigned for the duty position
OTHER	Freedom from fear of heights is mandatory for award and retention of this AFSC. Eligibility for a Secret security clearance according to AFI 31-501, *Personnel Security Program Management*, is mandatory for award and retention of this AFSC.
IMPLEMENTATION	Entry into formal upgrade is initiated upon assignment to the individual's first duty station. Qualification training is initiated anytime individuals are assigned duties for which they are not qualified. Use CDCs and AFJQSs/AFQTPs concurrently to obtain the necessary qualification for refresher and cross-utilization training.

10.3. **Craftsman (7-Level) Training.**

KNOWLEDGE	No additional knowledge requirements.
TRAINING	Communications-Electronics Career Advancement Course (In-residence), E3ACR2EX7X 002 (PDS 7SI) [Active Duty only] Communications-Electronics Career Advancement Course (Distance learning), E6ADL2EX7X 000 (PDS Code 4VI) [Guard/Reserve only] Communications-Electronics Career Advancement Course (Self-paced), E6AZS2EX7X 006 (PDS X2J) [Prerequisite for Guard/Reserve members prior to attending the above distance learning course]
EXPERIENCE	Qualification and possession of AFSC 2E152 Experience performing or supervising functions such as installing, testing, aligning, repairing, flight inspecting, and removing meteorological and navigation systems. Completion of all 2E172 CTG core tasks (See Attachment 4 of the STS for career training guide) Completion of AFQTP 2EXXXX-201L, Communications-Electronics Work Center Manager's Handbook Completion of applicable equipment/unit management function AFJQSs/AFQTPs
OTHER	Freedom from fear of heights is mandatory for award and retention of this AFSC. Eligibility for a Secret security clearance according to AFI 31-501, *Personnel Security Program Management*, is mandatory for award and retention of this AFSC.
IMPLEMENTATION	Entry into formal upgrade training is initiated when individuals obtain the necessary rank and skill level. Qualification training is initiated anytime an individual is assigned duties for which they are not qualified. Use CDCs and AFJQSs/AFQTPs concurrently to obtain the necessary qualification for refresher and cross-utilization training.

10.4. **Superintendent (9-Level) Training.**

KNOWLEDGE	Electronic principles theory and its application to ground radio, meteorological and navigation, combat camera, imagery, video, television, telemetry systems, space systems, intrusion detection, and satellite and microwave communications facilities, systems, equipment, and their interoperability Communications and computer elements of a typical air base Interpretation of wiring and logic diagrams, blueprints, and technical orders.
TRAINING	No AETC training requirement.
EXPERIENCE	Qualification and possession of AFSC 2E172 Experience is mandatory managing or directing functions such as installing, maintaining, repairing, or modifying the various systems and related equipment of the feeder specialties. AFQTP 2EXXXX-201LB, Communications-Electronics Manager's Handbook
OTHER	Eligibility for a Secret security clearance according to AFI 31-501, *Personnel Security Program Management*, is mandatory for award and retention of this AFSC.
IMPLEMENTATION	Entry into OJT is initiated when individuals are selected for the rank of SMSgt. Qualification training is initiated anytime individuals are assigned duties for which they are not qualified.

10.5. Training Sources.

10.5.1. Electronic Principles training - 332 TRS, Keesler AFB, MS at https://wwwmil.keesler.af.mil/.

10.5.2. AFSC specific training - 338 TRS, Keesler AFB, MS. at https://wwwmil.keesler.af.mil/.

10.5.3. 2EX7X Communications-Electronics Career Advancement course (7-Level School) – 338 TRS, Keesler AFB, MS at https://wwwmil.keesler.af.mil/.

10.5.4. CDC 2E152 is available for upgrade purposes through the unit training manager. For individual qualification and cross-utilization training, CDCs are ordered through the unit training office.

10.5.5. AFJQSs/AFQTPs are Air Force publications and are mandatory for use in qualification training. They are developed by the 81 TRSS (Q-Flight), Keesler AFB, MS and may be downloaded from https://wwwmil.keesler.af.mil/81trss/qflight/welcome.html. Procedures for requesting development of AFJQSs/AFQTPs are contained in AFI 36-2233 *Air Force On-the-Job Training Products for Communications-Electronics Enlisted Specialty Training*. AFJQSs/AFQTPs are listed in Part II, Section D, of this CFETP.

10.5.6. Air Force Engineering and Technical Service (AFETS) (course listing found at https://www.afca.scott.af.mil/c-e_maint/afets.htm), Contract Field Service (CFS), and Special Maintenance Team (SMT) training may be requested to provide on-site training. The AFETS program is outlined in AFI 21-110, *Engineering and Technical Services Management and Control*. Direct requests for AFETS, CFS, or SMT training to your MAJCOM.

Section D - Resource Constraints

11. Purpose. This section identifies known resource constraints that preclude optimal/desired training from being developed or conducted, including information such as part numbers, national stock numbers, number of units required, cost, manpower, etc. Included are narrative explanations of each resource constraint and an impact statement describing what effect each constraint has on training. Finally, this section includes actions required, OPR, and target completion date. Resource constraints will be, at a minimum, reviewed and updated annually.

12. Apprentice (3-Level) Training.

12.1. Constraints: None.

12.1.1. Impact. N/A

12.1.2. Resources Required. N/A

12.1.3. Action Required. N/A

12.2. OPR/Target Completion Date. N/A

13. Journeyman (5-Level) Training.

13.1. Constraints: None.

13.1.1. Impact. N/A

13.1.2. Resources Required. N/A

13.1.3. Action Required. N/A

13.2. OPR/Target Completion Date. N/A

14. Craftsman (7-Level) Training.

14.1. Constraints: None.

14.1.1. Impact. N/A

14.1.2. Resources Required. N/A

14.1.3. Action Required. N/A

14.2. OPR/Target Completion Date. N/A

Section E - Transition Training Guide

15. There are currently no transition training requirements. This area is reserved.

PART II

Section A - Specialty Training Standard

1. Implementation. The implementation of training in support of this STS is with the class beginning 20010201and graduating 20010606.

2. Purpose. As prescribed in AFI 36-2201, this STS:

2.1. The Course Training Standards (CTS) at Attachments 1 and 2:

2.1.1. Establishes the training requirements for airmen to perform 3-skill level duties in the Meteorological and Navigation Systems career ladder of the Airman Communications-Electronics Systems career field. The training tasks are based on an analysis of duties in AFMAN 36-2108 for AFSC 2E132.

2.1.2. Provides the basis for the development of more detailed training materials, training objectives, and training evaluation instruments for the course.

2.1.3. Shows formal training requirements. Attachment 1 lists the Electronic Principles requirements for this specialty and contains the proficiency code key pertaining to this attachment. Students receive this training through AETC course E3AQR2E132 481.

2.1.4. Attachment 2 contains a list of behavioral statements that describe knowledge and job performance requirements the graduate demonstrates on the job as a result of training received in course E3ABR2E132 002 as described in the Air Force Education and Training Course Announcements (ETCA) database (formerly AFCAT 36-2223, USAF Formal Schools Catalog). Part I, Section D, and the Preface to Attachment 2 explains constraints and/or guidelines to training. When notes or explanations describe constraints in the skill awarding course, they indicate that training on those items is restricted due to the limitation described.

2.2. The Five-Level Career Training Guide (CTG) at Attachment 3:

2.2.1. Provides a complete list of continuation training requirements for the award of AFSC 2E152. Attachment 3 contains the behavioral code key used to indicate the type of training provided by CDCs.

2.2.2. Identifies the mandatory task and knowledge training that is required for the 5-skill level in the Meteorological and Navigation Systems career field of the Airman Communications-Electronic Systems career ladder. These are based on an analysis of duties and responsibilities as outlined in AFMAN 36-2108.

2.3. The Seven-Level Career Training Guide (CTG) at Attachment 4:

2.3.1. Provides a complete list of continuation training requirements for the award of AFSC 2E172. Attachment 4 contains the behavioral code key used to indicate the type of training that will be provided.

2.3.2. Identifies the mandatory task and knowledge training that is required for the 7-skill level in the Meteorological and Navigation Systems ladder of the Airman Communications-Electronics Systems career field. These are based on an analysis of duties and responsibilities as outlined in AFMAN 36-2108.

2.4. The CTGs at Attachments 3 and 4:

2.4.1. Provide OJT certification columns to record completion of task and knowledge training requirements. Use automated training management systems to document technician qualifications, if available. Task certification must show a start and stop date.

2.4.2. Become a job qualification standard for OJT when placed in AF Form 623, On-the-Job Training Record, and used according to AFI 36-2201. OJT tasks in column 1 are trained to the go/no go level. Go means the individual can perform the task without assistance and meet local requirements for accuracy, timeliness, and correct use of procedures.

2.4.2.1. Training Documentation. Document and certify completion of training. Identify duty position requirements by circling the subparagraph number next to the task statement. Complete the following columns in Part II of the CFETP:

2.4.2.1.1. Initial Certification. Evaluate qualifications and when verified, certify using:

2.4.2.1.1.1. Core/Critical Tasks. Start date, stop date, trainee's initials, trainer's initials, and certifier's initials.

2.4.2.1.1.2. Non-Core/Non-Critical Tasks. Start date, stop date, trainee's initials, and trainer's initials.

2.4.2.1.2. Transcribing from Old Document to CFETP. Evaluate current qualifications and when verified recertify using:

2.4.2.1.2.1. Tasks Previously Certified and Required in Current Duty Position (Core/Critical Tasks). Current date as completion date, trainee's initials, and certifier's initials.

2.4.2.1.2.2. Tasks Previously Certified and Required in Current Duty Position (Non-Core/Non-Critical Tasks). Current date as completion date, trainee's initials, and trainer's initials.

2.4.2.1.2.3. Tasks Previously Certified but Not Required in Current Duty Position. Carry forward only the previous completion date of certification (not the initials of another person). If and when transcribed tasks become duty position requirements, recertify using standard certification procedures.

2.4.2.1.2.4. The person whose initials appear in the trainer or certifier block during the transcription process must meet the requirements of their prescribed role.

2.4.2.1.2.5. Give the member the old CFETP upon completion of transcription.

2.4.2.1.3. Documenting Career Knowledge. When a CDC is not available: the supervisor identifies STS training references the trainee requires for career knowledge and ensures, as a minimum, that trainees cover the mandatory items in AFMAN 36-2108, *Developing, Managing, and Conducting Training*. For two time CDC course exam failures, supervisors identify all STS items corresponding to the areas covered by the CDC. The trainee completes study of the STS references, undergoes evaluation by the task certifier, and receives certification on the STS. NOTE: Career knowledge must be documented prior to submitting a CDC waiver.

2.4.2.1.4. Decertification and Recertification. When an airman is found to be unqualified on a task previously certified, the supervisor lines through the previous certification or deletes the previous certification when using an automated system. Appropriate remarks are entered on the AF Form 623A, On-The-Job Training Record Continuation Sheet, as to the reason for decertification. The individual is recertified using the normal certification process.

2.4.3. Indicates career knowledge provided in the 5-skill level CDCs. See Air Force Institute for Advanced Distributed Learning (AFIADL) catalog maintained by the unit OJT manager for current CDC listings or go to http://www.maxwell.af.mil/au/afiadl.

2.4.4. Are guides for development of promotion tests used in the Weighted Airman Promotion System (WAPS). Specialty Knowledge Tests (SKT) are developed at the USAF Occupational Measurement Squadron by senior NCOs with extensive practical experience in their career fields. The tests sample knowledge of CTG subject matter areas judged by test development team members to be most appropriate for promotion to higher grades. Questions are based upon study references listed in the WAPS catalog. Individual responsibilities are listed in chapter 1 of AFI 36-2605, *Air Force Military Personnel Testing System.* WAPs is not applicable to the Air National Guard or Air Reserve forces.

3. Recommendations. Comments and recommendations are invited concerning the quality of AETC training. A Customer Service Information Line (CSIL) has been installed for the supervisors' convenience. For a quick response to concerns, call our CSIL at DSN 597-4566, fax us at DSN 597-3790, or e-mail us at, 81trg-tget@keesler.af.mil. Reference this CTS and identify the specific area of concern (paragraph, training standard element, etc).

BY ORDER OF THE SECRETARY OF THE AIR FORCE

OFFICIAL

MICHAEL E. ZETTLER, Lieutenant General, USAF
Deputy Chief of Staff /Installations & Logistics

Attachments:
1. Electronic Principles Course Training Standard
2. Course Training Standard, 2E132
3. Five-Level Career Training Guide, 2E152
4. Seven-Level Career Training Guide, 2E172

PREFACE

NOTE 1: Dashed items in this CTS are not part of the original CTS created at the August 1999 Electronic Principles U&TW however, they are the specific objectives taught in the Electronic Principles course designed to meet the CTS requirements.

NOTE 2: Unless otherwise stated, students may be allowed two assists from the instructor and still successfully achieve the proper level of proficiency. An instructor assist is anytime an instructor must intercede to provide guidance to a student which leads to a satisfactory completion of the objective or to prevent the student from continuing in a manner that will lead to an unsatisfactory conclusion, safety violation, or damage to equipment.

NOTE 3: All objectives are trained during wartime.

PROFICIENCY CODE KEY		
	SCALE VALUE	DEFINITION: The individual
Task Performance Levels	1	Can do simple parts of the task. Needs to be told or shown how to do most of the task. (EXTREMELY LIMITED)
	2	Can do most parts of the task. Needs help only on hardest parts. (PARTIALLY PROFICIENT)
	3	Can do all parts of the task. Needs only a spot check of completed work. (COMPETENT)
	4	Can do the complete task quickly and accurately. Can tell or show others how to do the task. HIGHLY PROFICIENT)
***Task Knowledge Levels**	a	Can name parts, tools, and simple facts about the task. (NOMENCLATURE)
	b	Can determine step by step procedures for doing the task. (PROCEDURES)
	c	Can identify why and when the task must be done and why each step is needed. (OPERATING PRINCIPLES)
	d	Can predict, isolate, and resolve problems about the task. (COMPLETE THEORY)
****Subject Knowledge Levels**	A	Can identify basic facts and terms about the subject. (FACTS)
	B	Can identify relationship of basic facts and state general principles about the subject. (PRINCIPLES)
	C	Can analyze facts and principles and draw conclusions about the subject. (ANALYSIS)
	D	Can evaluate conditions and make proper decisions about the subject. (EVALUATION)

EXPLANATIONS

* A task knowledge scale value may be used alone or with a task performance scale value to define a level of knowledge for a specific task. (Examples: b and 1b)

** A subject knowledge scale value is used alone to define a level of knowledge for a subject not directly related to any specific task or for a subject common to several tasks.

X This mark is used alone instead of a scale value to show that no proficiency training is provided in the course.

\- This mark is used alone in course columns to show that training is required, but not given, due to limitations in resources.

PROFICIENCY CODE

1. ELECTRONIC SUPPORT SUBJECTS.

1.1. Safety. B
- Identify safety precautions pertaining to electronics.

1.2. First Aid. B
- Identify first aid procedures for electrical injuries.

1.3. Electrostatic Discharge (ESD) Control. B
- Identify electrostatic discharge (ESD) sensitive device control methods.

1.4. Electromagnetic Effects (EMP/EMI). B
- Identify the techniques used to protect electronic equipment from the effects of electromagnetics (EMP/EMI).

1.5. Metric Notation.

1.5.1. Powers of Ten. B
- Convert decimal numbers to scientific notation and vice versa.
- Perform math operations of numbers expressed as scientific notation.

1.5.2. Electrical Prefixes. B
- Convert decimal numbers to electrical prefixes and vice versa.
- Convert electrical prefix values to other equivalent electrical prefix values.

2. USE TEST EQUIPMENT.

2.1. Analog Multimeter. 2b
- Identify the operating principles of the analog multimeter.
- Identify procedures for analog multimeter usage.
- Measure selected electrical values using analog and digital multimeters.

2.2. Digital Multimeter. 2b
- Identify the operating principles of the digital multimeter.
- Identify procedures for digital multimeter usage.
- Measure selected electrical values using analog and digital multimeters.

2.3. Oscilloscope. 2b
- Identify oscilloscope operating principles.
- Identify the procedures for oscilloscope usage.
- Measure selected electrical values using an oscilloscope and signal generator.

2.4. Signal Generator. 2b
- Identify the procedures for signal generator usage.
- Measure selected electrical values using an oscilloscope and signal generator.

3. BASIC CIRCUITS.

3.1. Direct Current (DC).

3.1.1. Terms. B
- Identify terms associated with direct current (DC) principles

PROFICIENCY CODE

3.1.2. Theory. B
- Identify circuit schematic symbols.
- Identify basic circuit operating principles.
- Determine the results of parameter changes on DC resistive circuits.
- Identify resistor voltage divider operating principles.

3.1.3. Calculations. B
- Calculate values for a series resistive DC circuit diagram.
- Calculate values for a parallel resistive DC circuit diagram.
- Calculate values for a series-parallel resistive DC circuit diagram.

3.2. Alternating Current (AC).

3.2.1. Terms. B
- Identify terms associated with AC principles.

3.2.2. Calculations. B
- Calculate AC voltage values.
- Calculate AC frequency/time values.

4. BASIC CIRCUIT COMPONENTS.

4.1. Resistors.

4.1.1. Theory. B
- Identify resistor characteristics.

4.1.2. Color Code. B
- Using resistor color code, determine the ohm/tolerance value of resistors.

4.1.3. Troubleshoot. 2b
- Troubleshoot a series-parallel resistive circuit to a faulty resistor.

4.2. Inductors.

4.2.1. Theory. B
- Identify characteristics of inductors.
- Identify inductor DC operating principles.
- Identify inductor AC operating principles.

4.2.2. Troubleshoot. 2b
- Troubleshoot a faulty inductor in a circuit.

4.3. Capacitors.

4.3.1. Theory. B
- Identify characteristics of capacitors.
- Identify capacitor DC operating principles.
- Identify capacitor AC operating principles.

4.3.2. Troubleshoot. 2b
- Troubleshoot a faulty capacitor in circuit.

PROFICIENCY CODE

4.4. Resistive-Capacitive-Inductive (RCL) Circuit Theory.

4.4.1. Basic. B
- Identify RCL circuit operating principles.

4.4.2. Resonant. B
- Identify resonant RCL circuit operating principles.

4.4.3. Frequency Sensitive Filter. B
- Identify frequency sensitive filter operating principles.

5. ELECTROMAGNETIC DEVICES.

5.1. Transformers.

5.1.1. Theory. B
- Identify characteristics of transformers.
- Identify transformer operating principles.

5.1.2. Troubleshoot. 2b
- Troubleshoot a faulty transformer.

5.2. Relays and Solenoids.

5.2.1. Theory. B
- Identify relay and solenoid operating principles.

5.2.2. Troubleshoot Relays. 2b
- Troubleshoot a faulty relay in a circuit.

5.3. Motor Theory.

5.3.1. Direct Current. B
- Identify DC motor operating principles.

5.3.2. Alternating Current. B
- Identify AC motor operating principles.

5.4. Generator Theory.

5.4.1. Direct Current. B
- Identify DC generator operating principles.

5.4.2. Alternating Current. B
- Identify AC generator operating principles.

5.5. Synchro/Servo.

5.5.1. Theory. B
- Identify servo/synchro operating principles.

	PROFICIENCY CODE
5.5.2. Fault Isolate. – Identify servo/synchro fault isolation procedures.	2b
5.6. Transducer Theory. – Identify transducer operating principles.	B
6. SOLID STATE DEVICES.	
6.1. Diodes.	
6.1.1. Theory. – Identify solid state diode operating principles.	B
6.1.2. Troubleshoot. – Identify diode fault isolation techniques. – Troubleshoot a diode circuit.	2b
6.2. Bipolar Junction Transistors.	
6.2.1. Theory. – Identify bipolar transistor operating principles.	B
6.2.2. Troubleshoot. – Troubleshoot a bipolar junction transistor circuit.	2b
6.3. Special Purpose Device Theory.	
6.3.1. Zener Diode. – Identify zener diode operating principles.	B
6.3.2. Light Emitting Diode (LED). – Identify LED operating principles.	B
6.3.3. Liquid Crystal Display (LCD). – Identify LCD operating principles.	B
6.3.4. Integrated Circuits (IC). – Identify integrated circuit (IC) operating principles.	B
6.3.5. Metal Oxide Semiconductor Field Effect Transistor (MOSFET). – Identify MOSFET operating principles.	B
6.3.6. Operational Amplifier (OP AMP). – Identify OP AMP operating principles.	B
7. TRANSISTOR AMPLIFIER CIRCUITS.	
7.1. Theory. – Identify the transistor amplifier configurations. – Identify common emitter amplifier operating principles. – Identify common collector amplifier operating principles. – Identify common base amplifier operating principles.	B

PROFICIENCY CODE

7.2. Stabilization. B
- Identify transistor amplifier temperature stabilization operating principles.

7.3. Coupling. B
- Identify coupling circuit operating principles.

7.4. Troubleshoot. 2b
- Troubleshoot a transistor amplifier circuit to a faulty component.

8. POWER SUPPLY CIRCUITS.

8.1. Theory.

8.1.1. Rectifiers. B
- Identify power supply rectifier operating principles.

8.1.2. Filters. B
- Identify power supply filter operating principles.

8.1.3. Voltage Regulators. B
- Identify shunt regulator operating principles.
- Identify series electronic voltage regulator (EVR) operating principles.

8.2. Troubleshoot. 2b
- Identify types of malfunctions in a filtered power supply circuit.
- Troubleshoot a filtered power supply circuit to a faulty component.
- Troubleshoot a series EVR circuit to a faulty component.

9. WAVE GENERATING CIRCUITS.

9.1. Theory.

9.1.1. Oscillators. B
- Identify the characteristics of oscillator circuits.
- Identify LC oscillator operating principles.
- Identify crystal oscillator operating principles.

9.1.2. Multivibrators. B
- Identify astable multivibrator operating principles.
- Identify monostable multivibrator operating principles.
- Identify bistable multivibrator operating principles.

9.1.3. Waveshaping Circuits. B
- Identify RC integrating/differentiating circuit operating principles.
- Identify sawtooth generator operating principles.

9.2. Fault Isolate. 2b
- Fault isolate a wave generating circuit.

PROFICIENCY CODE

10. DIGITAL NUMBERING SYSTEMS.

10.1. Conversions.

10.1.1. Binary. B
- Identify principles of binary conversions.

10.1.2. Octal. B
- Identify principles of octal conversions.

10.1.3. Hexadecimal. B
- Identify principles of hexadecimal conversions.

10.1.4. Binary Coded Decimal. B
- Identify principles of binary coded decimal (BCD) conversions.

10.2. Binary Math Operations. B
- Determine the results of math operations.

11. DIGITAL LOGIC CIRCUITS.

11.1. Theory.

11.1.1. Gates. B
- Identify principles of logic gate operation.

11.1.2. Flip-Flops. B
- Identify principles of flip-flop operation.

11.1.3. Counters. B
- Identify operating principles of counters.

11.1.4. Registers. B
- Identify operating principles of registers.

11.1.5. Combinational Logic Circuits. B
- Identify operating principles of combinational logic circuits.

11.2. Troubleshoot. B
- Troubleshoot a combinational logic circuit.

11.3. Digital-to-Analog (D/A) and Analog-to-Digital (A/D) Converter Theory. B
- Identify operating principles of a digital-to-analog (D/A) converters.
- Identify operating principles of analog-to-digital (A/D) converters.

12. BASIC COMPUTER FUNDAMENTALS.

12.1. Computer Theory.

12.1.1. Hardware. B
- Identify computer hardware operating principles.

	PROFICIENCY CODE
12.1.2. Software.	
12.1.2.1. Operating Systems. – Identify computer operating systems principles.	B
12.1.2.2. Virus Protection. – Identify computer virus protection operating principles.	B
12.1.2.3. Diagnostics. – Identify computer diagnostics operating principles.	B
12.1.2.4. Applications. – Identify computer applications operating principles.	B
12.1.3. Peripherals. – Identify computer peripheral devices operating principles.	B
12.2. Network Theory.	
12.2.1. Components. – Identify basic network hardware component operating principles.	B
12.2.2. Types. – Identify basic network communication system types.	B
12.2.3. Topologies. – Identify basic network physical topologies.	B
12.2.4. Communication Mediums. – Identify network medium operating principles.	B
13. BASIC COMMUNICATIONS THEORY.	
13.1. Antenna. – Identify antenna operating principles.	B
13.2. Transmission Lines. – Identify transmission line theory of operation.	B
13.3. Waveguides. – Identify waveguide operating principles.	B
13.4. Transmitters.	
13.4.1. Amplitude Modulation (AM). – Identify AM transmitter operating principles.	B
13.4.2. Frequency Modulation (FM). – Identify FM transmitter operating principles.	B

	PROFICIENCY CODE
13.5. Receivers.	
13.5.1. AM Receivers. – Identify AM receiver operating principles.	B
13.5.2. FM Receivers. – Identify FM receiver operating principles.	B
14. SOLDER AND DESOLDER.	
14.1. Terminal Connection. – Solder a wire to a terminal connector. – Desolder a wire from a terminal connector.	2b
14.2. Printed Circuit Board (PCB). – Solder three components to a PCB. – Desolder three components from a PCB.	2b
14.3. Multipin Connector. – Solder a tinned wire into a pin for use in a multipin connector. – Desolder a wire from a pin used in a multipin connector.	2b
14.4. Coaxial Connector. – Solder a coaxial connector center contact to a coaxial cable. – Desolder a coaxial connector center contact from a coaxial cable.	2b
15. ASSEMBLE SOLDERLESS CONNECTORS.	
15.1. Crimped Connection. – Splice two wires together using a crimp connector. – Crimp a terminal lug to a wire.	2b
15.2. Coaxial Connector. – Assemble a solderless coaxial cable connector to a coaxial cable.	2b
15.3. Multipin Connector. – Crimp a wire into a pin for use in a multipin connector. – Assemble a multipin connector.	2b

PREFACE

NOTE 1: Unless otherwise stated in the objective, the student may be allowed two assists from the instructor and still successfully achieve the proper level of proficiency. An instructor assist is defined as anytime an instructor must intercede to provide guidance to a student which leads to a satisfactory completion of the objective or to prevent a student from continuing in a manner which will lead to an unsatisfactory conclusion, safety violation, or damage to the equipment.

NOTE 2: All equipment related objectives are performed by following procedures from technical orders, technical manuals, or student instructional material developed by the training facility. Test equipment used throughout the course includes:

Power Meter	Digital Voltmeter
Oscilloscope	Vector Voltmeter
Digital Multimeter	Spectrum Analyzer
Frequency Counter	Peak Power Meter
Signal Generators	Portable ILS Receiver

NOTE 3: The equipment items identified below are used as training vehicles within the skill awarding course since it incorporates most of the basic principles and procedures found in the remainder of the AFSC's equipment inventory.

ML-102G Barometer	AN/FRN-44 VOR Navigational Set
ML-563/UM Barograph	AN/FRN-45 TACAN Navigational Set
ML-658/GM Digital Barometer-Altimeter	AN/FMQ-13 Wind Measuring Set
AN/GMQ-34 Cloud Height Set	AN/GRN-29 Instrument Landing System
AN/FMQ-8 Ambient Temperature and Dewpoint Measuring Set	
AN/PMQ-36 Transportable Wind Set	

NOTE 4: All objective references are performed as terminal objectives. Knowledge required to perform CTS elements is inherent in each objective. This includes, but is not limited to, defining the capabilities, limitations, and theory of operation of the stated item.

NOTE 5: All objectives are trained during wartime.

NOTE 6: No training deficiency shall exist if 100-watt amplifier alignment cannot be accomplished due to equipment downtime/non-availability during initial skills training course. The 100 watt amplifier alignment is only for familiarization as stated on page 15, paragraph 6.1 of this CFETP.

1. OPERATIONAL RISK MANAGEMENT PROGRAM.

1.1. Use safety practices when working with energized equipment.

1.2. Use safety practices when dealing with radio frequency (RF) equipment.

1.3. Use safety practices when using hand tools and test equipment.

1.4. Use safety practices when dealing with laser devices.

1.5. Identify climbing safety practices.

1.6. Explain the concepts of grounding, bonding, and shielding.

2. Use equipment specific technical publications when completing maintenance actions.

3. TEST EQUIPMENT.

3.1. Use multimeters to measure voltage and resistance when performing equipment maintenance.

3.2. Use oscilloscopes to measure voltage and time when performing equipment maintenance.

3.3. Use power/wattmeter to measure RF power when performing equipment maintenance.

3.4. Use frequency counter to measure frequency when performing equipment maintenance.

3.5. Use vector voltmeter to measure voltage standing wave ratio (VSWR) and cable length when performing equipment maintenance.

3.6. Use spectrum analyzer to measure bandwidth and power when performing equipment maintenance.

3.7. Use Portable ILS Receiver (PIR) to measure difference in depth of modulation (DDM) and percent of modulation when performing equipment maintenance.

4. INTRODUCTION TO METNAV.

4.1. Describe the METNAV career field.

4.2. Describe METNAV data communication applications.

5. WIND MEASURING SET, AN/FMQ-13.

5.1. State the functional description.

5.2. Perform the turn on/off procedures.

5.3. Troubleshoot the AN/FMQ-13 to determine the defective line replaceable unit (LRU).

6. TEMPERATURE-DEWPOINT MEASURING SET, AN/FMQ-8.

6.1. State the functional description.

6.2. Perform the turn on/off procedures.

6.3. Troubleshoot the AN/FMQ-8 to determine the defective LRU.

7. CLOUD HEIGHT SET, AN/GMQ-34.

7.1. State the functional description.

7.2. Perform the turn on/off procedures.

7.3. Troubleshoot the AN/GMQ-34 to determine the defective LRU.

8. DIGITAL ALTIMETER-BAROMETER, ML-658/GM.

8.1. State the functional description.

8.2. Perform the turn on/off procedures.

8.3. Troubleshoot the ML-658/GM to determine the defective LRU.

8.4. Order a component using an automated maintenance data collection system.

8.5. Enter maintenance data using an automated maintenance data collection system.

9. TRANSPORTABLE WEATHER SYSTEMS.

9.1. CLOUD HEIGHT SET, AN/GMQ-33.

9.1.1. State the functional description.

9.1.2. Identify the technical characteristics.

9.1.3. Describe the operation.

9.2. TRANSPORTABLE WIND SET, AN/TMQ-36.

9.2.1. State the functional description.

9.2.2. Identify the technical characteristics.

9.2.3. Describe the operation.

9.2.4. Set up and tear down the AN/TMQ-36. (class project)

9.2.5. Observe an instructor demonstration of the AN/TMQ-36 operation.

9.3. TRANSPORTABLE METEOROLOGICAL OBSERVING SET, AN/TMQ-34.

9.3.1. State the functional description.

9.3.2. Identify the technical characteristics.

9.3.3. Describe the operation.

10. INSTRUMENT LANDING SYSTEM (ILS), AN/GRN-29.

10.1. State the functional description of the AN/GRN-29.

10.2. Perform the turn on/off procedures for the AN/GRN-29.

10.3. Perform the power supply alignment on the AN/GRN-29.

10.4. Perform the localizer transmitter adjustments.

10.5. Perform the capture effect glideslope reference transmitter adjustments.

10.6. Perform the capture effect glideslope clearance transmitter adjustments.

10.7. Perform the course recombination adjustment on the AN/GRN-30.

10.8. Perform the monitor alignments on the AN/GRN-29.

10.9. Troubleshoot the AN/GRN-29 to determine the defective LRU.

10.10. Perform the transmitter RF power and monitor digital readout portions of the 28-day preventive maintenance inspection (PMI) on the AN/GRN-30.

10.11. Align the capture effect glideslope amplitude phase control unit (APCU).

11. MOBILE MICROWAVE LANDING SYSTEM (MMLS), AN/TRN-45.

11.1. State the functional description.

11.2. Identify the technical characteristics.

11.3. Describe the operation.

12. TACTICAL AIR NAVIGATION SYSTEM (TACAN), AN/FRN-45.

12.1. State the functional description.

12.2. Perform turn on/off procedures.

12.3. Operate the input/output terminal.

12.4. Perform reply pulse characteristic performance test.

12.5. Perform azimuth group characteristics performance test.

12.6. Perform identity group characteristics performance test.

12.7. Perform north trigger performance test.

12.8. Perform auxiliary trigger performance test.

12.9. Perform the digital computer clock/auxiliary interface alignment.

12.10. Perform the digital computer digital data modem alignment.

12.11. Perform the control indicator power supply alignment.

12.12. Perform the control indicator CODEC alignment.

12.13. Perform the power supply alignment.

12.14. Perform the transponder programmable echo level/receiver alignment.

12.15. Perform the transponder video processor alignment.

12.16. Perform the transponder encoder alignment.

12.17. Perform the transponder 400-watt amplifier alignment.

12.18. Perform the transponder 100-watt amplifier alignment. (Note 6)

12.19. Calibrate the directional coupler.

12.20. Perform the monitor voltage regulator alignment.

12.21. Perform the monitor frequency synthesizer alignment.

12.22. Perform the monitor multiplexer alignment.

12.23. Perform the monitor timing pulse generator alignment.

12.24. Perform the 84-day PMI.

12.25. Perform the 168-day PMI.

12.26. Troubleshoot the AN/FRN-45 to determine the defective LRU.

13. DEPLOYABLE TACAN, AN/TRN-41.

13.1. State the functional description.

13.2. Identify the technical characteristics.

13.3. Describe the operation.

14. DEPLOYABLE TACAN, AN/TRN-26.

14.1. State the functional description.

14.2. Identify the technical characteristics.

14.3. Describe the operation.

15. VERY HIGH FREQUENCY OMNIRANGE (VOR), AN/FRN-44.

15.1. State the functional description.

15.2. Perform turn on/off procedures.

15.3. Operate the input/output terminal.

15.4. Perform the power supply control alignment.

15.5. Perform the transmitter master oscillator alignment.

15.6. Perform the transmitter oscillator multiplier alignment.

15.7. Perform the transmitter audio processor alignment.

15.8. Perform the transmitter ident generator alignment.

15.9. Perform the transmitter phase compensator alignment.

15.10. Perform the monitor analog test generator alignment.

15.11. Perform the monitor signal processor alignment.

15.12. Perform the 84-day PMI.

15.13. Troubleshoot the AN/FRN-44 to determine the defective LRU.

16. FLIGHT INSPECTIONS AND GROUNDS CHECKS.

16.1. Perform a simulated flight inspection on the AN/GRN-29.

16.2. Describe the AN/FRN-44 flight inspection procedures.

16.3. Describe the AN/FRN-45 flight inspection procedures.

16.4. Describe the AN/GRN-30 ground check procedures.

16.5. Identify improper AN/GRN-30 ground check readings.

16.6. Perform ground check procedures on the AN/FRN-44.

17. Describe navigation aids equipment certification requirements.

BEHAVIORAL FORMAT CTG CODING SYSTEM

Each CTG element is written as a behavioral statement. The detail of the statement and verb selection reflects the level of training provided.

Code	Definition
K	Subject Knowledge Training - The verb selection identifies the individual's ability to identify facts, state principles, analyze, or evaluate the subject.
-	When this code is used in the OJT Upgrade Column it indicates that the certification or qualification on this task is a local determination. When this code is used in the CDC Column it indicates that no training for this subject is provided in the CDCs.
X	When this code is used in the OJT Upgrade Column it indicates that the individual must be trained and certified on this task before they can be upgraded to the appropriate skill level. This code indicates that training to satisfy this requirement is either provided through OJT, CDCs, or a combination of OJT and CDCs.
X*	When this code is used in the OJT Upgrade Column it indicates that the individual must be trained and certified on this task before they can be upgraded to the appropriate skill level if the assigned duty position is responsible to maintain/operate the equipment or system indicated as assigned by the local work center supervisor. This code indicates that training to satisfy this requirement is normally provided through OJT.

CFETP versus AFJQS task coding. AFJQSs/AFQTPs annotated in the CFETP with an “X” denotes the AFJQS is mandatory. Within the AFJQS are individual tasks that are coded either “X” or “X*”. If the tasks are coded “X,” they are mandatory. If coded “X*,” they are duty position specific.

The identification blocks listed below are to be used when the trainer is other than the trainee's immediate supervisor.

THIS BLOCK IS FOR IDENTIFICATION PURPOSES ONLY Personal Data - Privacy Act of 1974		
PRINTED NAME OF TRAINEE *(Last, First, Middle Initial)*	INITIALS *(Written)*	SSAN
PRINTED NAME OF TRAINER AND CERTIFYING OFFICIAL AND WRITTEN INITIALS		
N/I	N/I	
N/I	N/I	
N/I	N/I	
N/I	N/I	
N/I	N/I	
N/I	N/I	
N/I	N/I	

PREFACE

NOTE 1: Users are responsible for annotating technical references to identify current references pending CTG revision.

NOTE 2: AFJQS 2EXXX-200B, 2EXXX C-E Enlisted Specialty Training is mandatory for use in conjunction with this CTG. It sets the Air Force standard for qualification and certification for the following subject areas:

Career Progression Information
Information Security (INFOSEC)
Communications Security (COMSEC)
Protect MAJCOM/FOA Critical Mission Information
Physical Security
Electronic Emission Security (TEMPEST)
Electronic Warfare
Operational Risk Management
Training
Work Center Administration
Operator Care of Assigned Government Vehicles
Supply
Technical Orders (TO) and Technical Publications
Supervision
C-E Equipment Maintenance Management
C-E Equipment Maintenance System Inspecting, Reporting, and Forms

NOTE 3: Equipment/system knowledge and/or performance tasks are defined in the AFJQS. AFJQS items set the standard for qualification and certification and are mandatory for use in conjunction with this CTG. AFQTPs listed in the CTG are generally handbooks which do not have task listings, therefore tracking through the Core Automated Maintenance System (CAMS) is not possible. Annotate completion of these products on AF Form 623A.

NOTE 4: When an AFJQS is loaded into CAMS, letters in the AFJQS identifier are converted to the number representing each letter's alphabetical position (e.g., 200B would be loaded as 200.2). To save space, individual AFJQS tasks are not normally listed within the CTG. However, if a CTG task is closely related to an AFJQS task or area, the AFJQS task/heading is listed (e.g., 200.2.12) and the related CTG task is listed under it (e.g., 200.2.12.75). To prevent potential task numbering conflicts between AFJQS tasks and subordinate CTG tasks, subordinate CTG tasks start with the number 75. This creates gaps in the final task numbering sequence, but integrates related CTG and AFJQS tasks so they will be listed on your training documents in the same area and in order.

NOTE 5: When loading AFJQS tasks into the CAMS database, tasks are loaded as STS not 797 items.

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
1. ELECTRONIC PRINCIPLES (EP). TR: EP CBT and, TO 31-1-141 Series							
1.1. Identify principles and capabilities of electronic devices and circuits	-	K					
2. TEST EQUIPMENT. TR: TO 33K-1-100, Applicable test equipment technical orders							
2.1. Identify principles, capabilities, and limitations of the following test equipment items:							
2.1.1. Analog oscilloscope.	-	K					
2.1.2. Digital oscilloscope.	-	K					
2.1.3. Spectrum analyzer.	-	K					
2.1.4. Analog multimeter.	-	K					
2.1.5. Digital multimeter.	-	K					
2.1.6. Power meter.	-	K					
2.1.7. Optical time domain reflectometer.	-	K					
2.1.8. Time domain reflectometer.	-	K					
2.1.9. Bit error rate test set.	-	K					
2.1.10. RF signal generator.	-	K					
2.1.11. Frequency counter.	-	K					
2.1.12. Vector voltmeter.	-	K					
2.1.13. Insulation test set.	-	K					
2.1.14. Portable ILS receivers (PIR).	-	K					
2.2. Perform equipment maintenance using the following test equipment/devices:							
2.2.1. Oscilloscope.	X*	-					
2.2.2. Spectrum analyzer.	X*	-					
2.2.3. Multimeter.	X*	-					
2.2.4. Power meter.	X*	-					
2.2.5. Signal generator.	X*	-					
2.2.6. Frequency counter.	X*	-					
2.2.7. Vector voltmeter.	X*	-					
2.2.8. Insulation test set.	X*	-					
2.2.9. Portable ILS receivers (PIR).	X*	-					

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
2.2.10. Vibraground.	X*	-					
3. STANDARD MAINTENANCE PRACTICES.							
3.1. Describe basic troubleshooting procedures.	X*	-					
3.2. Interpret results of diagnostic programs.	X*	-					
3.3. Interpret diagrams for fault isolation.	X*	-					
3.4. Locate elements such as unit, module, row, column, component, pin, connector, or test point using alphanumeric designator.	X*	-					
3.5. Solder and desolder electronic equipment components.	X*	-					
4. COMPUTER SECURITY (COMPUSEC). TR: AFI 33-202 and AFQTP 2EXXX-202D							
4.1. Define COMPUSEC.	X	-					
4.2. Identify vulnerabilities and incidents.	X	-					
4.3. Describe data protection techniques.	X	-					
4.4. Describe basic countermeasures.	X	-					
4.5. Describe reporting procedures.	X	-					
4.6. Explain malicious logic.	X	-					
4.7. Describe methods of malicious logic protection.	X	-					
4.8. Describe TEMPEST suppression techniques.	X*	-					
4.9. Perform TEMPEST maintenance.	X*	-					
5. STANDARD INSTALLATION PRACTICES. TR: TOs 31-10-7, 31-10-11, 31-10-13, 31-10-24, 31W-3-6, 31W-1-102, 31W2-4-330 series, and 31W3-10-20; TIA/EIA-568A & 569; AFI 32-1065; AFJQS 2EXXX-202B							
5.1. State facts related to the following practices:							
5.1.1. Installation.	X	K					
5.1.2. Configuration.	X	K					
5.1.3. Interconnection.	X	K					
5.1.4. Inspection.	X	K					
5.2. Explain the importance of cable labeling and installation documentation.	X	K					
5.3. Describe wire color coding standards.	X*	K					
5.4. Describe fiber optics installation concepts.	X*	K					
5.5. Describe the concepts of:							

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
5.5.1. Grounding.	X	K					
5.5.2. Bonding.	X	K					
5.5.3. Shielding.	X	K					
5.5.4. Lightning protection.	X	K					
5.6. Remove or install equipment grounds.	X*	-					
5.7. Check quality of equipment grounds.	X*	-					
5.8. Identify procedures to terminate multi-conductor cables.	X*	-					
5.9. Construct the following cable connectors:							
5.9.1. Multi pin.	X*	-					
5.9.2. Modular.	X*	-					
5.9.3. Coaxial.	X*	-					
5.9.4. Fiber.	X*	-					
5.10. Isolate and repair malfunctions in cable assemblies.	X*	-					
6. COMMUNICATIONS PRINCIPLES. TR: TO 31-1-141 Series							
6.1. State facts relating to the following:							
6.1.1. Amplitude modulation (AM).	-	K					
6.1.2. Frequency modulation (FM).	-	K					
6.1.3. Phase modulation (PM).	-	K					
6.1.4. Pulse code modulation (PCM).	-	K					
6.1.5. Bandwidth.	-	K					
6.1.6. Lightwave communications.	-	K					
6.1.7. Asynchronous/synchronous communication modes.	-	K					
6.1.8. Error detection and correction.	-	K					
6.2. State facts relating to the theory of operation of the following interface standards and protocols:							
6.2.1. EIA/RS-232C.	-	K					
6.2.2. EIA/RS-449.	-	K					
6.2.3. EIA/RS-422.	-	K					
6.2.4. EIA/RS-423.	-	K					
6.2.5. EIA-530.	-	K					

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
6.2.6. EIA-568.	-	K					
6.2.7. V.35.	-	K					
6.2.8. MIL STD 188-114A.	-	K					
6.2.9. TCP/IP. TR: CBT Volume--Microsoft TCP/IP on Windows NT 4.0: Introduction to TCP/IP and IP Addressing http://afcbt.den.disa.mil	-	-					
6.2.10. X.25/1822.	-	-					
6.2.11. GOSIP.	-	-					
6.3. State facts relating to the theory of operation of communication protocols/addressing. TR: CBT Volume--Internetworking Essentials: Introduction to Common Networking Protocols and Internetworking Overview http://afcbt.den.disa.mil	-	-					
6.4. State facts relating to the following switching methods: TR: CBT Volume--WAN Technologies http://afcbt.den.disa.mil							
6.4.1. Circuit.	-	-					
6.4.2. Message.	-	-					
6.4.3. Packet.	-	-					
6.4.4. Asynchronous transfer mode (ATM). TR: CBT Volume--WAN Technologies: ATM Principles http://afcbt.den.disa.mil	-	-					
6.5. State facts relating to the following multiplexing methods: TR: CBT Volume--Internetworking Essentials: 1) Data Communications: Signals and Systems 2) WAN Technologies http://afcbt.den.disa.mil							
6.5.1. Frequency division multiplexing (FDM).	-	-					
6.5.2. Time division multiplexing (TDM).	-	-					
6.5.3. T1 rate and higher.	-	-					
6.6. State facts relating to the following cryptology methods:							
6.6.1. Secret key/symmetrical (traditional cryptographic equipment).	-	-					
6.6.2. Public key/asymmetrical (FORTEZZA).	-	-					
7. INFORMATION TRANSPORT CONCEPTS.							

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
7.1. State facts relating to the theory of operation of the following network configurations: TR: CBT Volume--Novell Networking Technologies: Concepts and Services; CBT Volume—Internetworking Essentials: LAN Fundamentals; and CBT Volume--LAN Technologies: LAN Topologies and Techniques at http://afcbt.den.disa.mil							
7.1.1. Network topologies (Star, Ring, Bus, etc.).	X	-					
7.1.2. Network types (LAN, WAN, VPN).	X	-					
7.2. State facts relating to the theory of operation of the following information transport devices: TR: CBT Volume--Internetworking Essentials: Fundamentals of Internetworking; CBT Volume--LAN Technologies: LAN Media and Components http://afcbt.den.disa.mil							
7.2.1. Routers.	X	-					
7.2.2. Hubs (concentrators).	X	-					
7.2.3. Bridges.	X	-					
7.2.4. Gateways.	X	-					
7.2.5. Switches.	X	-					
7.2.6. Data terminal equipment (DTE).	X	-					
7.2.7. Data communications equipment (DCE).							
7.2.7.1. Modems.	X	-					
7.2.7.2. Data service units/channel service units (DSU/CSU).	X	-					
7.2.8. Multiplexers.	X	-					
7.2.9. Network interface card.	X	-					
7.2.10. Common encryption devices used in AF and DOD communication networks.	-	-					
7.2.11. Integrated Digital Network Exchange (IDNX).	-	-					
8. EXPEDITIONARY COMMUNICATIONS CONCEPTS. TR: https://aefcenter.acc.af.mil							
8.1. Identify basic concepts of the Aerospace Expeditionary Force (AEF) deployment process. TR: AFI 10-400, Chap 1 thru 3	X	K					

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
8.2. Explain basic concepts of Unit Type Codes (UTC) and Force Packaging as it relates to the AEF tasking process. TR: AFMAN 10-401, Chap 4 thru 6; http://www.fas.org/man/dod-101/usaf/docs/cwpc/4200-FO.htm	X	K					
8.3. Describe deployment procedures. TR: AFMAN 10-100; MAJCOM and Local Directives							
8.3.1. Pre-deployment.	X	K					
8.3.2. Employment.	X	K					
8.3.3. Post deployment.	X	K					
8.3.4. Recovery.	X	K					
8.4. Identify deployable communications systems associated with this AFSC.	X	K					
8.5. Accomplish the following mobility procedures: TR: Applicable MAJCOM directives; TOs 00-20-series							
8.5.1. Pre-deployment inspections.	X*	-					
8.5.2. Air mobility equipment preparation.	X*	-					
8.5.3. Road mobility equipment preparation.	X*	-					
8.5.4. Post-deployment turn around.	X*	-					
9. ELECTRICAL POWER SYSTEMS.							
9.1. Describe the application of the following types of uninterruptible power supplies:							
9.1.1. Batteries. TR: AFJQS 3E0X2-214D, Module 1	X*	-					
9.1.2. Switched electrical power systems. TR: AFQTP 3E0X2-213YA, Module 1 and 2	X*	-					
9.2. Describe the application of the following types of generators:							
9.2.1. Fixed.	X*	-					
9.2.2. Mobile/tactical.	X*	-					
9.2.3. 60 Hertz.	X*	-					
9.2.4. 400 Hertz.	X*	-					
9.3. Describe commercial power requirements.	X*	-					
9.4. Describe power phasing requirements.	X*	-					

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
10. MAINTAIN NON-ELECTRIC BAROMETRIC EQUIPMENT.							
10.1. Barograph, ML-563 TR: TO 31M2-3ML3-1	-	-					
10.2. Aneroid Barometer, ML-102 TR: TO 31M2-3ML102-1	-	-					
11. RUNWAY VISUAL RANGE COMPUTING SET, AN/FMN-1A TR: TO 31M1-2FMN1-11							
11.1. State the functional description.	X*	K					
11.2. Identify the technical characteristics.	X*	K					
11.3. Describe the operation.	X*	-					
11.4. Perform turn on/turn off procedures.	X*	-					
11.5. Recognize normal indications.	X*	-					
11.6. Analyze block diagram functional operation.	-	K					
11.7. Analyze circuit operation.	-	-					
11.8. Accomplish alignment and adjustment routines.	X*	-					
11.9. Troubleshoot to determine the defective LRU.	-	-					
11.10. Perform preventive maintenance routines.	X*	-					
12. TRANSPORTABLE WIND SET, AN/TMQ-36. TR: TO 31M1-2TMQ36 Series							
12.1. State functional description.	X*	K					
12.2. Identify the technical characteristics.	X*	K					
12.3. Describe the operation.	X*	K					
13. TRANSPORTABLE TACTICAL AIR NAVIGATION (TACAN) SYSTEM, AN/TRN-41. TR: TO 32R4-2TRN41 Series							
13.1. State functional description.	X*	K					
13.2. Identify the technical characteristics.	X*	K					
13.3. Describe the operation.	X*	K					
14. MOBILE MICROWAVE LANDING SYSTEM (MMLS), AN/TRN-45.							
14.1. State functional description.	X*	K					
14.2. Identify the technical characteristics.	X*	K					
14.3. Describe the operation.	X*	K					

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
15. MARKER BEACON, AN/GRN-32. TR: 31R4-2GRN32-2							
15.1. State the functional description.	X*	K					
15.2. Identify the technical characteristics.	X*	K					
15.3. Describe the operation.	X*	K					
16. Describe basic theory and radiation patterns of the following antennas:							
16.1. ILS.	X*	-					
16.2. VOR.	X*	-					
17. METNAV EQUIPMENT INSTALLATION. TR: AFI 33-102 and 33-104; TO 31-10 Series and 31Z Series							
17.1. Analyze policies and procedures for programming and planning installation of C-E equipment.	-	-					
17.2. Install METNAV equipment in accordance with installation instructions.	-	-					
17.3. Interconnect METNAV equipment in accordance with installation instructions.	-	-					
17.4. Inspect METNAV equipment installations in accordance with installation instructions.	-	-					
17.5. Inspect METNAV equipment during pre-installation and post installation phases.	-	-					
18. FACILITY CERTIFICATION. TR: AFI 21-116, Attachment 11							
18.1. Accomplish facility certification.	X*	K					
18.2. Interpret and evaluate facility data to determine if systems meet established reference parameters.	X*	K					
200. AIR FORCE JOB QUALIFICATION STANDARDS APPLICABLE TO AFSC 2E152. TR: AFI 21-116, 36-2233, CFETP 2E1X2 (See Notes 3 and 4)							
200.2. AFJQS 2EXXX-200B, 2EXXX C-E Enlisted Specialty Training. (See Note 2)	X						
200.2.8. Operational Risk Management.							
200.2.8.3. Identify and report safety hazards.	X	K					
200.2.13. Technical Orders (TO) and Technical Publications.							

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
200.2.13.2. Comply with TO instructions when performing maintenance. TR: TO 00-5-1; Applicable TO's	X	K					
200.2.13.3. Initiate AFTO Form 22, TO System Improvement Report and Reply. TR: TO 00-5-1; Command and Local Directives	X*	K					
200.2.13.75. Describe the technical order system.	-	K					
200.2.13.76. Identify types of technical orders.	-	K					
200.2.16. C-E Equipment Maintenance System Inspecting, Reporting, and Forms.							
200.2.16.3. Update communications-computer systems installation records (CSIRS). TR: AFI 21-404; Local Directives	X*	K					
200.4. AFJQS XXXXX-200D, Aerospace Expeditionary Force (AEF) Qualification Training.	X*						
201.3. AFJQS 2EXXX-201C, Corrosion Prevention and Control.	X						
201.5. AFJQS 2EXXX-201E, Communications-Electronics (C-E) Core Automated Maintenance System (CAMS).	X*						
201.7. AFJQS 2EXXX-201G, Maintenance Support.	X*						
201.8. AFJQS 2EXXX-201H, Work Center Deficiency/Discrepancy Reporting.	X*						
201.10. AFJQS 2EXXX-201J, Maintenance Training Program.	X*						
201.12. AFQTP 2EXXX-201L, Communications-Electronics (C-E) Work Center Manager's Handbook. (See Note 3)	X*						
201.16. AFJQS 2EXXX-201P, Work Center Test Equipment Management.	X*						
202.1. AFQTP 2EXXX-202A, Electrostatic Discharge Familiarization Handbook.	X*						
202.2. AFJQS 2EXXX-202B, SIPT Electronics and Inside Plant (E&I).	X*						
202.4. AFQTP 2EXXX-202D, EI Tempest Installation Handbook.	X*						
202.11. AFJQS 2E1X2-202K, AN/FMQ-8 Ambient Temp and Dew Point Measuring Set.	X*						
202.11.75. State the functional description.	X*	K					

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
202.11.76. Identify the technical characteristics.	X*	K					
202.11.77. Describe the operation	X*	-					
202.11.78. Analyze block diagram functional operation.							
202.11.78.1. Analog system.	-	K					
202.11.78.2. Sensor assembly.	-	K					
202.11.78.3. Display indicator.	-	K					
202.11.79. Analyze circuit operation.							
202.11.79.1. Power supply.	-	-					
202.11.79.2. Analog system.	-	-					
202.11.79.3. Sensor assembly.	-	-					
202.11.79.4. Display indicator.	-	-					
202.14. AFJQS-2E1X2-202N, AN/FMQ-13 Wind Measurement Set.	X*						
200.14.75. Perform system troubleshooting. TR: 31M1-2FMQ13-3, para 5	-	-					
202.14.76. State the functional description.	X*	K					
202.14.77. Identify the technical characteristics.	X*	K					
202.14.78. Describe the operation.	X*	-					
202.14.79. Analyze block diagram functional operation.	-	K					
202.14.80. Analyze circuit diagram functional operation.	-	-					
202.16. AFJQS 2E1X2-202P, AN/TMQ-36 Tactical Wind Measuring Set.	X*						
202.17. AFJQS 2E1X2-202Q, AN/GMQ-32 Transmissometer Set.	X*						
202.17.75. State the functional description.	X*	K					
202.17.76. Identify the technical characteristics.	X*	K					
202.17.77. Describe the operation.	X*	-					
202.17.78. Perform turn on/turn off procedures	-	-					
202.17.79. Recognize normal indications.	-	-					
202.17.80. Analyze block diagram functional operation.	-	K					
202.17.81. Analyze circuit operation.							
202.17.81.1. Projector.	-	K					
202.17.81.2. Receiver.	-	K					
202.17.81.3. Recorder.	-	K					

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
202.17.82. Identify the procedures used in accomplishing servicing routines.	-	-					
202.19. AFJQS 2E1X2-202S, AN/GMQ-33 Transportable Cloud Height Indicator.	X*						
202.19.75. State the functional description.	X*	K					
202.19.76. Identify the technical characteristics.	X*	K					
202.19.77. Describe the operation.	X*	K					
202.22. AFJQS 2E1X2-202V, Runway Visual Range Remote Display System, RVR-400.	X*						
202.23. AFJQS 2E1X2-202W, ML-658/GM Digital Altimeter-Barometer.	X*						
202.23.75. State the functional description.	X*	K					
202.23.76. Identify the technical characteristics.	X*	K					
202.23.77. Describe the operation.	X*	-					
202.23.78. Analyze block diagram functional operation.	-	K					
202.23.79. Analyze circuit operation.							
202.23.79.1. Power supply.	-	-					
202.23.79.2. Input circuits.	-	-					
202.23.79.3. Processing and memory card.	-	-					
202.23.79.4. Display card.	-	-					
202.24.1. AFJQS 2E1X2-202XA, Next Generation Radar Principle User Processor (NEXRAD PUP)	X*						
203.5. AFQTP 2E1X2-203E, ILS Training Handbook.	X*						
204.19. AFJQS 2E1X2-204S, AN/TRN-26 Tactical Air Navigation (TACAN).	X*						
204.19.75. State the functional description.	X*	K					
204.19.76. Identify the technical characteristics.	X*	K					
204.19.77. Describe the operation.	X*	-					
204.19.78. Analyze block diagram functional operation.	X*	K					
204.25. AFJQS 2E1X2-204Y, AN/GRN-29 Flight Inspection Procedures.	X*						
204.25.75. Describe the types of flight checks.	X*	K					
204.25.76. Describe facility classification.	X*	K					
204.25.77. Explain technician responsibilities.	X*	K					
204.25.78. Explain the principles of localizer flight inspection procedures.	-	K					

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
204.25.79. Explain the principles of glideslope flight inspection procedures.	-	K					
204.25.80. Explain the principles of VOR flight inspection procedures.	-	K					
204.25.81. Explain the principles of TACAN flight inspection procedures.	-	K					
204.25.82. Perform and record system ground check on: TR: AFM 11-225; Applicable Equipment Technical Publications							
204.25.82.1. ILS.	X*	-					
204.25.82.2. VOR.	X*	-					
205.7. AN/GRN-30, INSTRUMENT LANDING SYSTEM. TR: Applicable AFJQSs							
205.7.1. AFJQS 2E1X2-205GA, AN/GRN-29 Remote Control/Display Unit.	X*						
205.7.1.75. State the functional description.	X*	K					
205.7.1.76. Identify the technical characteristics.	X*	K					
205.7.1.77. Describe the operation.	X*	-					
205.7.1.78. Recognize normal indications.	-	K					
205.7.2. AFJQS 2E1X2-205GB, AN/GRN-31 Null Reference Glideslope Maintenance.	X*						
205.7.2.75. State the functional description.	X*	K					
205.7.2.76. Identify the technical characteristics.	X*	K					
205.7.2.77. Describe the operation.	X*	-					
205.7.2.78. Recognize normal indications.	-	K					
205.7.2.79. Analyze block diagram functional operation.							
205.7.2.79.1. Power supplies.	-	K					
205.7.2.79.2. Transmitters.	-	K					
205.7.2.79.3. RF distribution.	-	K					
205.7.2.79.4. Antenna systems.	-	K					
205.7.2.79.5. RF combining unit.	-	K					
205.7.2.79.6. Monitors.	-	K					
205.7.2.79.7. Control units.	-	K					

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
205.7.3. AFJQS 2E1X2-205GC, AN/GRN-31 Capture Effect Glideslope Maintenance.	X*						
205.7.3.75. State the functional description.	X*	K					
205.7.3.76. Identify the technical characteristics.	X*	K					
205.7.3.77. Describe the operation.	X*	-					
205.7.3.78. Recognize normal indications.	-	K					
205.7.3.79. Analyze block diagram functional operation.							
205.7.3.79.1. Transmitters.	-	K					
205.7.3.79.2. RF distribution.	-	K					
205.7.3.79.3. Antenna systems.	-	K					
205.7.3.79.4. RF combining unit.	-	K					
205.7.3.79.5. Monitors.	-	K					
205.7.4. AFJQS 2E1X2-205GD, AN/GRN-30 Localizer Maintenance.	X*						
205.7.4.75. State the functional description.	X*	K					
205.7.4.76. Identify the technical characteristics.	X*	K					
205.7.4.77. Describe the operation.	X*	-					
205.7.4.78. Recognize normal indications.	-	K					
205.7.4.79. Analyze block diagram functional operation.							
205.7.4.79.1. Transmitters.	-	K					
205.7.4.79.2. RF distribution.	-	K					
205.7.4.79.3. Antenna systems.	-	K					
205.7.4.79.4. RF combining unit.	-	K					
205.7.4.79.5. Monitors.	-	K					
206.13. AFQTP 2E1X2-206M, Introduction to Ionosphere Handbook.	X*						
206.20.4. AFJQS 2E1X2-206TD, AN/TMQ-34 Meteorological Measuring Set.	X*						
206.20.4.75. State the functional description.	X*	K					
206.20.4.76. Identify the technical characteristics.	X*	K					
206.20.4.77. Describe the operation.	X*	K					
213.21. AFJQS XXXXX-213U, Tactical Generator Operation for Non Power Production Personnel.	X*						
213.22. AFJQS XXXXX-213V, Power Plant Operation for Non-Power Production AFSCs.	X*						

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
215.17.1. AFJQS 2E1X2-215QA, AN/FRN-45 Tactical Air Navigation System (TACAN).	X*						
215.17.1.75. State the functional description.	X*	K					
215.17.1.76. Identify the technical characteristics.	X*	K					
215.17.1.77. Describe the operation.	X*	-					
215.17.1.78. Recognize normal indications.	-	K					
215.17.1.79. Analyze block diagram functional operation.							
215.17.1.79.1. Antenna system.	-	K					
215.17.1.79.2. Power supply.	-	K					
215.17.1.79.3. Transponder.	-	K					
215.17.1.79.4. RF Amplifiers.	-	K					
215.17.1.79.5. Monitor.	-	K					
215.17.1.79.6. Computer.	-	K					
215.17.2. AFJQS 2E1X2-215QB, AN/FRN-44 Very High Frequency Omnirange (VOR) Maintenance.	X*						
215.17.2.1. Input/output terminal (IOT) operating procedures. TR: 31R4-2FRN44-2-32GE-1	-	K					
215.17.2.75. State the functional description.	X*	K					
215.17.2.76. Identify the technical characteristics.	X*	K					
215.17.2.77. Describe the operation.	X*	-					
215.17.2.78. Analyze block diagram functional operation.							
215.17.2.78.1. Antenna system.	-	K					
215.17.2.78.2. Power supplies.	-	K					
215.17.2.78.3. Transmitter.	-	K					
215.17.2.78.4. Monitor.	-	K					
215.17.2.78.5. Computer.	-	K					
215.20. AFJQS 2E1X2-215T, AN/GMQ-34 Cloud Height Set.	X*						
215.20.75. State the functional description.	X*	K					
215.20.76. Identify the technical characteristics.	X*	K					
215.20.77. Describe the operation.	X*	-					
215.20.78. Analyze block diagram functional operation.							

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	5-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
215.20.78.1. Indicator.	-	K					
215.20.78.2. Laser Ceilometer.	-	K					
215.20.78.3. Interface.	-	K					

BEHAVIORAL FORMAT CTG CODING SYSTEM

Each CTG element is written as a behavioral statement. The detail of the statement and verb selection reflects the level of training provided.

Code	Definition
K	Subject Knowledge Training - The verb selection identifies the individual's ability to identify facts, state principles, analyze, or evaluate the subject.
-	When this code is used in the OJT Upgrade Column it indicates that the certification or qualification on this task is a local determination. When this code is used in the CDC Column it indicates that no training for this subject is provided in the CDCs.
X	When this code is used in the OJT Upgrade Column it indicates that the individual must be trained and certified on this task before they can be upgraded to the appropriate skill level. This code indicates that training to satisfy this requirement is either provided through OJT, CDCs, or a combination of OJT and CDCs.
X*	When this code is used in the OJT Upgrade Column it indicates that the individual must be trained and certified on this task before they can be upgraded to the appropriate skill level if the assigned duty position is responsible to maintain/operate the equipment or system indicated as assigned by the local work center supervisor. This code indicates that training to satisfy this requirement is normally provided through OJT

CFETP versus AFJQS task coding. AFJQSs/AFQTPs annotated in the CFETP with an “X” denotes the AFJQS is mandatory. Within the AFJQS are individual tasks that are coded either “X” or “X*”. If the tasks are coded “X,” they are mandatory. If coded “X*,” they are duty position specific.

The identification blocks listed below are to be used when the trainer is other than the trainee's immediate supervisor.

THIS BLOCK IS FOR IDENTIFICATION PURPOSES ONLY Personal Data - Privacy Act of 1974		
PRINTED NAME OF TRAINEE *(Last, First, Middle Initial)*	INITIALS *(Written)*	SSAN
PRINTED NAME OF TRAINER AND CERTIFYING OFFICIAL AND WRITTEN INITIALS		
N/I	N/I	
N/I	N/I	
N/I	N/I	
N/I	N/I	
N/I	N/I	
N/I	N/I	
N/I	N/I	

PREFACE

NOTE 1: Users are responsible for annotating technical references to identify current references pending CTG revision.

NOTE 2: Completion of AFQTP 2EXXX-201L, Work Center Manager's handbook is mandatory for upgrade to the 7-level.

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	7-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
70. DEPLOYMENT CONCEPTS.							
70.1. Deployment Plans. TR: AFI 10-201							
70.1.1. Describe the purpose of the following:							
70.1.1.1. OPLAN communications requirements.	X						
70.1.1.2. Time Phased Force Deployment Document (TPFDD).	X						
70.1.1.3. Unit readiness reporting procedures.	X						
70.1.1.4. Report UTC status to command authorities.	X						
70.2. Unit Type Code (UTC) Development and Reporting. TR: AFMAN 10-401							
70.2.1. Identify UTC development process.	X						
70.2.2. Identify UTC adjustment procedures.	X						
70.3. Deployment Procedures. TR: AFIs 10-403, 33-211; and 21-109; AFMAN 23-110							
70.3.1. Develop load plan.	X*						
70.3.2. Explain pallet build-up procedures.	X*						
70.3.3. Explain hazardous cargo preparation.	X*						
70.3.4. Prepare documentation.	X*						
70.3.5. Determine site selection requirements.	X*						
70.3.6. Determine site preparation requirements.	X*						
70.3.7. Determine site configuration requirements.	X*						
70.3.8. Determine requirements for constructing deployment site utility grids.	X*						
70.3.9. Describe control of COMSEC material.	X*						
71. SYSTEM PLANNING AND IMPLEMENTATION. TR: AFI 33-104 and AFI 21-404; TO 32-series; AFQTP 2EXXX-202B							
71.1. Identify systems support requirements for new or modified systems.	X						
71.2. Describe how to manage planning and implementation of new systems.	X						
72. State facts relating to the following work center management principles. (See Note 2) TR: AFQTP 2EXXX-201L							

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	7-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
72.1. Principles of management.	X						
72.2. Training.	X						
72.3. Supply.	X						
72.4. Core Automated Maintenance System (CAMS).	X						
72.5. Work center management.	X						
72.6. Safety and security.	X						
72.7. Maintenance standards.	X						
72.8. Performance reports.	X						
72.9. Awards and recognition.	X						
72.10. Mobility/deployment.	X						
72.11. Manpower.	X						
72.12. Financial management.	X						
73. EQUIPMENT SITING. TR: TO 31-10 Series and 31Z Series							
73.1. Explain ILS, VOR, TACAN, and Wind Measuring system siting criteria.	X						
74. INSTRUMENT LANDING SYSTEM, AN/GRN Series. TR: TO 31R4-2GRN29 Series, 31R4-2GRN30 Series, 31R4-2GRN31 Series, 31R4-2GRN32 Series							
74.1. Analyze and interpret RF distribution circuits.	X*						
74.2. Analyze and interpret antenna theory and radiation pattern.	X						
74.3. Analyze and interpret RF recombining and monitoring.	X*						
74.4. Analyze and interpret the effects of the alignment and adjustment routines on system performance.	X*						
75. TACTICAL AIR NAVIGATION (TACAN) SYSTEM, AN/FRN-45. TR: TO 31R4-2FRN45 Series							
75.1. Analyze and interpret antenna theory and radiation pattern.	X*						
75.2. Analyze and interpret the effects of the alignment and adjustment routines on system performance.	X*						
75.3. Interpret RF development and RF amplification.	X*						
76. OMNIRANGE, AN/FRN-44.							

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	7-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
76.1. Analyze and interpret antenna theory and radiation pattern.	X*						
76.2. Analyze and interpret the effects of the alignment and adjustment routines on system performance.	X*						
77. FLIGHT INSPECTIONS AND GROUND CHECKS. TR: AFMAN 11-225; Applicable equipment technical publications							
77.1. Supervise flight inspections.	-						
77.2. Perform flight inspections.							
77.2.1. Pre-flight inspection procedures.							
77.2.1.1. ILS.	X*						
77.2.1.2. VOR.	X*						
77.2.1.3. TACAN.	X*						
77.2.2. Flight inspection procedures.							
77.2.2.1. ILS.	X*						
77.2.2.2. VOR.	X*						
77.2.2.3. TACAN.	X*						
77.2.3. Apply problem-solving techniques to resolve deficiencies identified during flight inspections.	X*						
77.2.4. Analyze flight inspection report data.	X*						
77.2.5. Compare new flight inspection report against reference flight inspection report to determine potential system degradation.	X*						
77.3. Ground Checks.							
77.3.1. Interpret and evaluate ground information to determine if systems meet established reference parameters.	X*						
77.3.2. Apply problem-solving techniques to resolve deficiencies.	X*						
78. Describe the procedures associated with the installation and acceptance of new or modified equipment or systems. TR: AFIs 33-102 and 33-104; TO 31-10 Series	X*						
79. TRANSPORTABLE AIR NAVIGATION SYSTEMS. TR: Applicable equipment technical orders							
79.1. Interpret and verify emplacement data.	X*						
79.2. Ensure facility is ready for flight inspection.	X*						

TASKS, KNOWLEDGE AND TECHNICAL REFERENCES	7-LEVEL		OJT CERTIFICATION				
	OJT Upgrade	CDC	Start Date	Stop Date	Trainee Initials	Trainer Initials	Certifier Initials
80. TRANSPORTABLE SYSTEMS DEPLOYMENT PROCEDURES. TR: Applicable AFOSH standards; TO 00-20 Series; Commercial Manuals							
80.1. Pre-Deployment.							
80.1.1. Ensure deployment package is Unit Type Code (UTC) complete.	X*						
80.1.2. Ensure deployment package is documentation complete.	X*						
80.2. Post Deployment.							
80.2.1. Ensure that historical data is transferred to permanent records upon return to home station.	X*						

Section B - Course Objective List

4. This section not used.

Section C - Support Materials

5. The following is a list of available support materials.

5.1. **Computer Based Training Products.** Air Force computer based training products can be found at http://afcbt.den.disa.mil.

5.2. **Air Force Job Qualification Standards and Air Force Qualification Training Packages**

5.2.1. Refer to AFIND8, Numerical Index of Specialty Education/Training Publications, for the list of published AFJQSs/AFQTPs or download these products from https://wwwmil.keesler.af.mil/81trss/qflight/welcome.html. Refer to AFI 36-2233, *Air Force On-the-Job Training Products for Communications-Electronics Enlisted Specialty Training*, for information on how to request development of AFJQSs/AFQTPs.

5.2.2. AFJQSs/AFQTPs applicable to AFSC 2E1X2:

Publication No.	Pseudo Code	Publication Title
AFJQS 2E1X2-202K	2E1X2-202.11	AN/FMQ-8 Ambient Temp and Dew Point Measuring Set
AFJQS 2E1X2-202N	2E1X2-202.14	AN/FMQ-13 Wind Measurement Set
AFJQS 2E1X2-202P	2E1X2-202.16	AN/TMQ-36 Tactical Wind Measuring Set
AFJQS 2E1X2-202Q	2E1X2-202.17	AN/GMQ-32 Transmissometer Set
AFJQS 2E1X2-202S	2E1X2-202.19	AN/GMQ-33 Transportable Cloud Height Indicator
AFJQS 2E1X2-202V	2E1X2-202.22	Runway Visual Range Remote Display System, RVR-400
AFJQS 2E1X2-202W	2E1X2-202.23	ML-658/GM Digital Altimeter-Barometer
AFJQS 2E0X1-202XA	2E0X1-202.24.1	WSR-88D Next Generation Radar Principle User Processor (NEXRAD PUP)
AFQTP 2E1X2-203E	2E1X2-203.5	ILS Training Handbook
AFJQS 2E1X2-204S	2E1X2-204.19	AN/TRN-26 Tactical Air Navigation (TACAN)
AFJQS 2E1X2-204Y	2E1X2-204.25	AN/GRN-29 Flight Inspection Procedures
AFJQS 2E1X2-205GA	2E1X2-205.7.1	AN/GRN-29 Remote Control/Display Unit
AFJQS 2E1X2-205GB	2E1X2-205.7.2	AN/GRN-31 Null Reference Glideslope Maintenance
AFJQS 2E1X2-205GC	2E1X2-205.7.3	AN/GRN-31 Capture Effect Glideslope Maintenance
AFJQS 2E1X2-205GD	2E1X2.205.7.4	AN/GRN-30 Localizer Maintenance
AFQTP 2E1X2-206M	2E1X2-206.13	Introduction to Ionosphere Handbook
AFJQS 2E1X2-206TD	2E1X2-206.20.4	AN/TMQ-34 Meteorological Measuring Set
AFJQS 2E1X2-215QA	2E1X2-215.17.1	AN/FRN-45 Tactical Air Navigation System (TACAN)
AFJQS 2E1X2-215QB	2E1X2-215.17.2	AN/FRN-44 Very High Frequency Omnirange (VOR) Maintenance
AFJQS 2E1X2-215T	2E1X2-215.20	AN/GMQ-34 Cloud Height Set

5.2.3. Additional AFJQS/AFQTP maintenance management and generic training products applicable to this specialty.

Publication No.	Pseudo Code	Publication Title
AFJQS 2EXXX-200B	2EXXX-200.2	2EXXX C-E Enlisted Specialty Training
AFJQS XXXXX-200D	XXXXX-200.4	Aerospace Expeditionary Force (AEF) Qualification Training
AFJQS 2EXXX-201C	2EXXX-201.3	Corrosion Prevention and Control
AFJQS 2EXXX-201E	2EXXX-201.5	Communications-Electronics (C-E) Core Automated Maintenance System
AFJQS 2EXXX-201G	2EXXX-201.7	Maintenance Support

Publication No.	Pseudo Code	Publication Title
AFJQS 2EXXX-201H	2EXXX-201.8	Work Center Deficiency/Discrepancy Reporting
AFJQS 2EXXX-201J	2EXXX-201.10	Maintenance Training Program
AFQTP 2EXXX-201L	2EXXX-201.12	Communications-Electronics (C-E) Work Center Manager's Handbook
AFQTP 2EXXX-201LB	2EXXX-201.12.2	Communications-Electronic (C-E) Manager's Handbook
AFJQS 2EXXX-201P	2EXXX-201.16	Work Center Test Equipment Management
AFJQS 2EXXX-201X	2EXXX-201.24	Engineering Installation (EI) Quality Assurance
AFQTP 2EXXX-202A	2EXXX-202.1	Electrostatic Discharge Familiarization Handbook
AFJQS 2EXXX-202B	2EXXX-202.2	SIPT Electronics and Inside Plant (E&I)
AFQTP 2EXXX-202D	2EXXX-202.4	EI Tempest Installation Handbook
AFJQS XXXXX-213U	XXXXX-213.21	Tactical Generator Operation For Non Power Production Personnel
AFJQS XXXXX-213V	XXXXX-213.22	Power Plant Operation for Non-Power Production AFSCs
AFQTP 3E0X2-213YA	N/A	Solid State Uninterruptible Power System Principles
AFJQS 3E0X2-214D	3E0X2-214.4	Stationary Battery Banks

Section D - Training Course Index

6. The following is a list of the available Air Force in-residence, field, and/or exportable training courses.

6.1. **Air Force In-Residence Courses.** For information on all formal courses, refer to the Air Force Education and Training Course Announcements (ETCA) database, formerly AFCAT 36-2223, USAF Formal Schools Catalog at https://hq2af.keesler.af.mil/etca.htm.

Course Number	Course Title	Location
E3ABR2E132 002	Meteorological and Navigation Systems Apprentice	Keesler

6.2. **Air Force Engineering Technical Services (AFETS) Training.** For a listing of AFETS courses, refer to the *Catalog of Communications-Electronics Air Force Engineering and Technical Services Courses.* This catalog is revised annually and is available through your MAJCOM's C-E MATAG Working Group representative or can be downloaded from https://www.afca.scott.af.mil/c-e_maint/afets.htm.

Section E - MAJCOM Unique Requirements

7. There are currently no MAJCOM unique requirements. This area is reserved.